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# JOB MOBILITY AND CLASS MOBILITY IN TAIWAN: FROM THE LIFE-COURSE PERSPECTIVE

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# JOB MOBILITY AND CLASS MOBILITY IN TAIWAN: FROM THE LIFE-COURSE PERSPECTIVE

**by**

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# Dedication

This dissertation is dedicated to my mother, Tsai, Mei-Li, my husband, Huang, Jang-Chuan, and my son, Huang, Chia-Tai.

# JOB MOBILITY AND CLASS MOBILITY IN TAIWAN: FROM THE LIFE COURSE PERSPECTIVE

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Paying specific attention to influences of life events and different timing of taking compulsory military service (CMS) for Taiwanese people, this dissertation explores time-dependence of job mobility and class mobility throughout careers. The author criticizes that previous research of social mobility focusing on either differences between father's and son's classes or the relationship between one's initial and current statuses do not realize the process of status attainment in which individual characteristics and life courses continuously interact with external structures in the labor market.

The analyses in this dissertation demonstrate the dynamics of career mobility by specifying two career stages and investigating the differences in paces and mechanisms of job change and class mobility. All findings lead to the conclusion that time dependence of career mobility is deeply embedded in the context of life course in a society. For Taiwanese men, the timing of taking CMS (i.e., before or after their first entry into the labor force), which is also strongly correlated with their educational levels,

is crucial to the pace and type of career development. For Taiwanese women, their trajectories of job change follow the typical scenario of career mobility, which job mobility occurs frequently during the early career and has relatively low transition rates in the later stage. Compared to job mobility, status attainment is more stable and consistent throughout the life time. After specifying the directions of job mobility, results show that upward and downward mobility, which bring significant change in occupational prestige, do not show gender differences in their transition rates, and their patterns are consistent throughout careers. With respect to the transition between social classes, moving into ownership (including employers and self-employed) in later careers is a mainstream transition for all Taiwanese people in spite the fact that women have much lower transition rates than do men.

Moreover, this dissertation also examines inter-sector and intra-sector mobility in segmented labor market in Taiwan. Taking selection bias into consideration, this research found that under the assumption of homogeneity, the treatment effects of initial attainment in the public sector have negative effects on job mobility throughout careers. However, when heterogeneity of treatment effects are taken into account, findings reveal that there is no significant heterogeneity in this treatment effect for Taiwanese men, but for Taiwan women, the more likely they are to attain a position in the public sector in the beginning of their careers, based on their educational achievement and social background, the more they benefit via low transition rates of job mobility throughout their work lives.

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# Chapter 1: Introduction

Work is one of the most important areas of modern life. New entrants into the labor force can expect to work for 30 to 40 years. Within this long period of time, how people make job changes and attain specific social positions is a complicated process, interweaving individual attributes and structures of opportunities, and, most importantly, how these attributes and opportunities changing over time affect individual's status attainment.

Early research on status attainment focused on how people reach their current status by investigating the influences of family background, individual education, and initial job status (Blau and Duncan 1967; Featherman 1972; Hauser 1969; Sewell, Haller and Portes 1969). While this research implies a concept of continuous career development, the time aspect in the research framework is specious. First, the "current" job in status attainment models is the position people hold at an arbitrary point of time set by researchers. Since it is based on the researcher's clock, not respondent's, the time span between individuals' first and current jobs varies. We should then ask whether the status people attain in a mature career stage is parallel to that of those who are still novices in the labor market. Moreover, because of the relative time frame, these models fail to locate themselves precisely in historical time, and the lack of control on the influences of the structure and its change is understandable (cf. Sorensen 1986).

Since the 1980s, responding to a methodological innovation, event history models, as well as the availability of longitudinal data, researchers of job mobility have been able to examine detailed occupational histories and estimate transition rates of jobs, status, and wage mobility throughout individuals' careers (e.g., Blossfeld and Mayer

1988; Hannan, Schomann and Blossfeld 1990; Mayer and Carroll 1987). The treatment of every job in the lifetime as the unit of analysis and the connection of job spells to absolute, historical time make it possible to control for the changes in individuals' characteristics and structural circumstances simultaneously (e.g., Blossfeld 1986; Shin 2007).

Previous research on job mobility has generated much understanding about the complicated process of intra-generational status attainment. Briefly, three sets of factors are considered to fully explain the process: individual characteristics, the structure of the labor market, and time (Rosenfeld, 1992). Human capital theory assumes that individual ability and endowment are basic elements that affect individuals' location in specific positions. This theory provides an ideal type via the demand-meets-supply perspective to explain the distribution of social status in society. When the long period of work life is considered, however, human capital is not fixed after schooling, but accumulates with experience in the labor market. Moreover, some people increase their educational attainment through attending further/adult education after entering the labor force. Individuals may also enhance their human capital by taking advantage of training or opportunities for development provided by employers, and acquiring specific certificates by passing national examinations. The research on job mobility has largely ignored the influences of human capital accumulated after schooling on career development.

Although the research on intra-generational job mobility pays more attention to the time aspect of status attainment, it seldom considers the transitions between different stages of career development. Individuals are expected to have an uncertain period at the beginning of careers when they look for adequate occupations fitting their abilities, try their hands at various jobs, and then change them if they are ill-matched or maladjusted. The concept of an "optimal job" may be helpful to explaining the time dependency of

career mobility. An optimal job refers to one with which the incumbent is satisfied as a whole. But this does not mean that all jobs are optimal simply because people "decided" to take them. It means that by taking structural opportunities, personal ability, and his/her present life stage into account, workers would like to hold a job for a relatively long period of time. They will hold this job until significant changes in any of these aspects, such as a tremendous upswing in their human capital or recessionary labor market conditions. After trial runs and attaining an optimal job in the early career, workers enter a relatively stable phase, which is characterized by low rates of job change.

The scenario of career development common to our daily experience has received little attention from sociologists of job mobility. William Johnson, an economist, introduces the idea of job shopping, which is different from the notion of job searching in sociology. "Job shopping refers to the period of experimentation with jobs and accompanying high rates of mobility, which typically occurs at the beginning of the working life" (Johnson 1978:261). The concept of job shopping assumes that some job conditions and characteristics cannot be known until actually taking the jobs. Johnson's finding that there is a rapid decrease in job mobility at the beginning of individuals' work lives provides some evidence about the time dependency of career mobility.

Focusing on life-course perspectives, this study investigates intra-generational career mobility, including job and status changes, in Taiwan. This dissertation aims to fulfill two main objectives that current research on job mobility does not: 1. Different from treating job spells in the work life as equivalent events, I argue that the process of status attainment is time dependent, which is characterized by different paces and mechanisms of job changes, and rudimentarily explore the distinctions of job mobility within different career phases. 2. I aim for an integrative understanding of the dynamic of intra-generational career mobility by accounting for individual and structural

characteristics in Taiwanese society. As Wright (1980:177) noted: "Sociologists have generally regarded 'class' and 'occupation' as occupying essentially the same theoretical terrain." Occupation has been a main component of social status, and studying job mobility may help explain the process of status attainment. However, job change and class change are actually different processes with distinct mechanisms. For example, while people stumble over job matching in the early career, job changes in this period may stagnate at the same level and not necessarily result in a status move. After specifying career stages, this project further demonstrates the interactions between both processes and investigates the constraints that class structure exerts on job changes in different phases of careers.

### 1.1 LIFE-COURSE PERSPECTIVES IN THIS RESEARCH

A life-course perspective is a way of thinking and studying human lives, rather than a field of inquiry, theory, or method (Elder 1994). As a major research paradigm, it focuses on the time aspect of social research objects and seeks to explain how social change affects people's lives differently (e.g., Baltes 1987; Cowan and Cowan 1992; Elder 1974, 1975; Kertzer and Keith 1984; Pavalko, Elder and Clipp 1993). This approach accentuates the effects of cohort and its related structural changes on the social processes, e.g., social relationships, aging and its adaptation. People who were born in different times encounter corresponding historical events and are distinctly influenced in their subsequent lives. In a word, "time" is the point. The effect and strength of a change depend on when people experience the change in their lives. As Elder (1995:5) summarizes:

> Overall the life course can be viewed as a multilevel phenomenon, ranging from structured pathways through social institutions and organizations to the social trajectories of individuals and their developmental pathways. . . . With an eye to

> the full life course, analysis is sensitive to the consequences of early transitions for later experiences and events.

Inspired by the life-course perspective, this research investigates the process of intra-generational career mobility in three ways. First, at the individual level, entry into marriage and parenthood are two significant life events that may strongly influence one's pattern of job change and labor force participation. To examine their interactions with career development, the technique of episode-splitting in event history data (Blossfeld and Rohwer 2002:131-75) is applied in this research to dynamically capture the timing of these life events and to detect the subsequent changes in the paces of job and class mobility.

Second, life courses and their normative ordering are embedded and well institutionalized in society (Kruger and Levy 2001). Although people have a range of discretion, the temporal order of life events in which people proceed may affect other domains in life cycle of social importance (Elder, 1975; Hogan, 1978). In Taiwan, compulsory military service (CMS) is an important life event for men. Most men (close to 90 percent) have served in the military for two to three years at some point in their lives. Jobs before CMS are usually seen as stopgap jobs that do not really matter to a man's career. Perhaps the experience of CMS for men is so common in Taiwan that it seldom becomes a topic of study. Does the working history before CMS have a learning effect and help reduce the time and effort people spend on job searching after CMS? Are there different patterns of job changes among people who start their careers before and after CMS? When the time dependence of career development is examined, the timing of taking CMS (i.e., before or during careers) becomes fundamental to understanding early career mobility for Taiwanese men.

Third, the incorporation of effects of the dynamic opportunity structure is a main issue in research, because the time span of intra-generational career mobility can last for decades. Following Blossfeld's (1986) strategy, this research constructs two factors, national development and economic cycle, to estimate the cohort and period effects of structure on job and class mobility over the lifetime of work. The cohort effect of structure, which refers to the influence of structure at the time of first entry into the labor market, serves as a baseline in the course of structural change. The period effect is the instant effect of the labor market condition each time people make job shifts. Both effects are indexes of historical location for each job spell in the structure.

In brief, keeping a life-course perspective in mind, this research considers the interactions between career mobility and other important parallel processes: at the level of individual, the timing of entering marriage and parenthood and the order of taking CMS for Taiwanese men, and at the macro level, the structural change of the labor market over time. Taking a life-course perspective, this research aims to provide a detailed explanation of the time dependence of career mobility.

### 1.2 LABOR MARKET AND THE IMAGE OF SUCCESS IN TAIWAN

Taiwan is a newly industrializing economy, well known for its fast development and relatively low inequality (Howe 1996). As one of "the Four Little Dragons" in East Asia, Taiwan's economic miracle has been a big challenge to both the theory of modernization (e.g., Fei, Ranis and Kuo 1979; Galensin 1979) and dependency theories (e.g., Amesden 1979; Barrett and Whyte 1982) in the sociology of development (cf. Pang 1992, 1993 for a detailed review). The Kuomintang (KMT) government moved to Taiwan from the Chinese mainland in 1949 and took over all basic, heavy industries and

the infrastructure[1] built up by the Japanese during the colonial period. To consolidate its legitimacy, land reform was immediately carried out to break up the existing advantaged group in Taiwan, which required landlords to lower rents and finally to sell land to tenants through the government (Cheng and Gereffi 1994; Noble 1988; for details of land reform, cf. Ho 1978:159-74). Because Taiwan is a small island with meager natural resources, two stages of economic development, respectively focusing on import substitution and export-led of light, labor-intensive industries, such as textiles and processed food products, immediately followed (Hsiao 1988; Pang 1992).

Accounting for a small group of foreign technocrats immigrating from Mainland China, Taiwan's economic bureaucracy was able to display the state autonomy and state capacities, which were credited with Taiwan's fast and efficient development by some students of theories of national development (Gold 1986; Hofheinz and Calder 1982:21-26; Pang 1992; Skocpol 1985). From 1952 to 1996, the per-capita Gross National Product (GNP) in Taiwan increased more than a hundredfold (145 vs. 15,651 USD), and the annual growth rate was 8.71 percent, on average, but the rates of unemployment stayed low (2.57 percent, on average), and the household income of the highest 20 percent was about four to five times greater than that of the lowest 20 percent. In the meanwhile, the booming economy was paralleled by a rapid transition of industries. In 1961 the agricultural population in Taiwan was, for the first time, less than the population of the manufacturing and service industries, and then in 1988, the population of service industries first exceeded the manufacturing population. By 1996, the proportion of the economically active population working in agriculture was reduced to 10.12 percent from 56.69 percent in the early 1950s, and people working in the service sector reached 52.39

[1] Basic and heavy industries, for example, included steel, petroleum, petrochemical, shipbuilding, transport equipment, fertilizer, and heavy machinery. The infrastructure covered electricity, gas, railway, water, and the bank and financial system.

percent, far surpassing those working in the industrial sector (37.49 percent) (DGBAS[2] 2004).

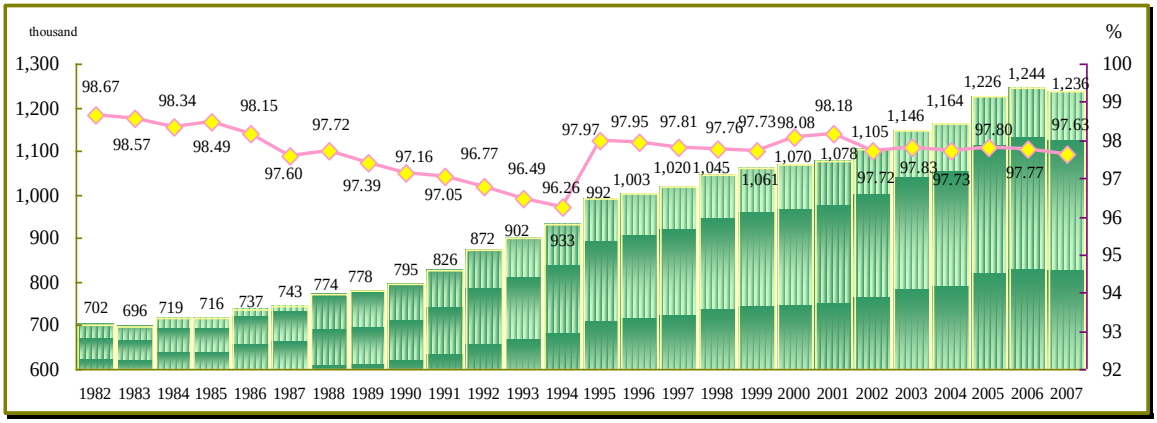


Figure 1.1 Number of Establishments and Percentages of SMEs in Taiwan, 1982-2007.

Source: *Yearbook of Small and Medium Enterprises 2008*. Taipei: Small and Medium Enterprise Administration, Ministry of Economic Affairs, Executive Yuan,

Molded by the particular historical background, a contrast between public and private sectors marks the Taiwan labor market. The public sector is stable and, as described above, in control of basic and heavy industries. During the 1978-1997 period, more than 11 percent of the labor force worked for the public sector (including governments and public enterprises) until the policy of privatization of public enterprises was implemented in the late 1990s (DGBAS 2008).[3] The private sector, by contrast, is comprised of a large number of small and medium enterprises[4] (SMEs) in light, labor-intensive and service industries, with an average of less than 10 regular employees (e.g.,

[2] The DGBAS (Directorate General of Budget, Accounting and Statistics) online database of Manpower Survey Statistics is over http://www.stat.gov.tw/ct.asp?xItem=18844&ctNode=4944 (in Chinese) or at http://eng.stat.gov.tw/ct.asp?xItem=15761&ctNode=1609 (in English).

[3] After privatization, the proportion of the active population working for the public sector decreased to 9.21 percent in 2008 (DGBAS 2008).

[4] By the definition of DGBAS, Executive Yuan, Republic of China, a SEM refers to an enterprise with less than 200 regular employees in the manufacturing, construction, mining, and quarrying industries, or less than 50 in other industries.

8.6 in 1981 and 7.6 employees in 1996 [DGBAS 2001]). Figure 1.1 shows the percentages of SMEs in Taiwan from 1982 to 2007. Except for 1992-1994, SMEs have accounted for more than 97 percent of establishments, and thus they have become a key feature of Taiwan's economy.

The distinct structure of the labor market also contributes to unique perceptions about what constitutes a successful Taiwanese career. Job security, occupational prestige, and income are three general dimensions for judging the goodness of a job in Taiwan, and each of them is somewhat intertwined with the division of public-private sectors as well. First, job security has been individuals' most important consideration when choosing a job. To illustrate, Figures 1.2 and 1.3 show respondents' answers to the questions, "Do you feel that job security is more important than being promoted?' and "What is your main consideration when you are looking for a job?"[5] in the Taiwan Social Change Survey (TSCS).[6] During the past two decades, more than 70 percent of Taiwanese have agreed that job security is more important than being promoted and that job security is the first priority when job searching, followed by satisfaction of one's own interest and high income. Because the wages are protected from economic cycles and fluctuations, the pension and fringe benefits are regulated well, and the condition of job tenure is guaranteed through national examinations, positions in the public sector have been thought as a "golden bowl" which promises a stable and secure career (Hwang 2001b). As a result, despite of its medium income level, civil servants and officials, for example, hold respected and secure positions that many Taiwanese would like to pursue.

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[5] Figure 1.3 plots the percentages of first four common choices (job security, satisfaction of one's own interest, high income, and the feeling of achievement) and promotion opportunities. The other choices include short working hours, ample time for one's free use, other, and no comment, which are not displayed here.

[6] The TSCS is a cross-sectional, panel survey project that focuses on 2-3 selected topics a year and repeats the same topic every 5 years for capturing the time-series of social changes in Taiwan. Since the first nation-wide survey conducted in 1985, the TSCS had accumulated 42 surveys by 2009.

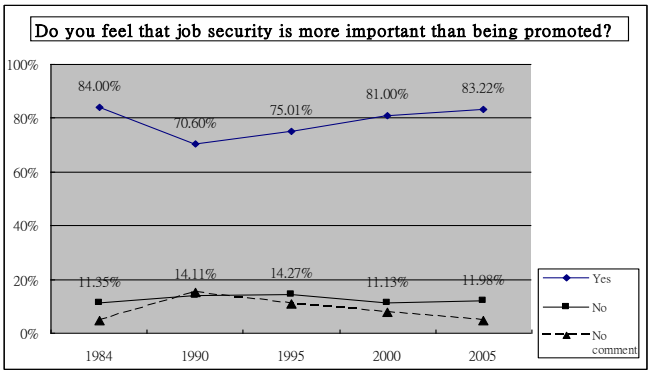


Figure 1.2 Importance of Job Security for Taiwan People

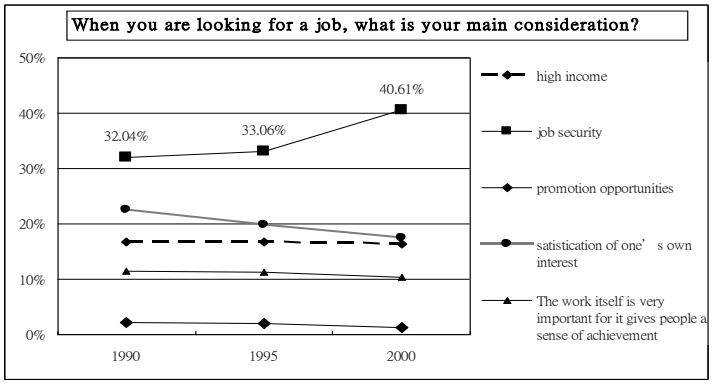


Figure 1.3 Main Consideration of Job Attainment for Taiwan People

Second, occupational prestige reflects a job's desirability and "goodness" (Goldthorpe and Hope 1972). Although occupational prestige is a cultural universal (Featherman, Jones and Hauser 1975; Ganzboom and Trieman 1996; Treiman 1977), the image of any particular occupation is society-specific. Because the tradition of Chinese culture makes education especially valued in Taiwanese society, occupational prestige is highly correlated with educational achievement. Jobs with high educational and professional requirements are regarded as reputable. Hwang (2003) updated the occupational prestige scale by regressing subjective prestige on income, skill

requirements,[7] and the ethical image of an occupation in Taiwan. The four categories of occupations with the highest prestige are: (1) professors and researchers, (2) doctors, lawyers and legal professionals, (3) accountants and business professionals, and (4) legislators, educators, and government administrators. He found that professors' incomes are not as high as doctors', but they enjoy the highest rating for ethical image and status prestige, which is competitive with medical specialists. Taiwanese teachers at other levels of education also enjoy relatively high respect and reputation compared to their international counterparts (Fwu and Wang 2002).

Third, as described above, a considerable number of SMEs compose the private sector, and about 60 percent of them are family enterprises,[8] in which family members or relatives occupy important positions. Non-family workers are normally frozen out of being promoted (Hamilton and Biggart 1988; Wong 1985). Furthermore, because of their small size, seniority is hardly accumulated within firms. As a result, inter-firm mobility, rather than intra-firm mobility is prevalent in the private sector. In addition, the flexible arrangement of production in Taiwan, which divides the whole process of manufacturing into detailed tasks and subcontracts them to many firms, provides a low-skill threshold for entry into self-employment or small employers (Shieh 1992b, 1993; Yu and Su 2004). Many Taiwanese dream of having an establishment and earning on their own. For example, the phenomenon of "black-hands becoming their own bosses," in which

[7] Skill requirement is operationalized by two components: education requirement and adequate job experience. The respondents are asked, "For a worker with the same level of . . . education [as yours], how much job experience does he/she need to be qualified [for] your current job?" Education is general human capital, and job experience is the specific-job human capital, in other words, the actual experience of occupying the job (Smith 1990).

[8] It has been thought that SMEs are mostly family enterprises in Taiwan, however, no specific formal data are available to prove this. *White Paper on SMEs in Taiwan* is an annual report of detailed statistics about SMEs provided by Small and Medium Enterprise Administration, Ministry of Economic Affairs, Executive Yuan, Republic of China. If we use sole proprietorship as a criterion to identify family enterprises, its proportion has been close to 60 percent (SMEA 2008:47). This could be an underestimation, however, because firms built on partnerships could be family enterprises as well.

apprentices or workers in small manufacturing units become self-employed or employers with their small own shops, was significant in Taiwan society in 1980s and 1990s (Sheu and Hwan, 2002; Shieh, 1989, 1992a). Some of them further aggrandized their establishments and became directors of large corporations. Stories about such individuals serve as examples of success in Taiwanese society. Becoming one's own boss provided a path of upward mobility that was generally related to increasing income and autonomy, but not necessarily to rising prestige for people with low education in the private sector (Hsung and Hwang 1992; Hsung, Sun and She 1986).

The process of intra-generational mobility is embedded in the specific context of a society. The general images of success rooted in Taiwan's historical and cultural background provide people with a frame of reference to judge the relative positions of themselves and others. The special labor force structure and production arrangements in Taiwan serve to channel the flow of people in the stratification system. Taiwan's fast development and social change since the postwar era have accelerated intra-generation status mobility within a relatively short period of time. This opportunely provides a panorama of interaction between lifetime mobility and changing structure that can be used to help understand the dynamic of status attainment.

# Chapter 2: Empirical and Theoretical Background

## 2.1 Research on Intergenerational Mobility

Ganzeboom, Treiman, and Ultee (1991) review research on social stratification over the past four decades and summarize three generations of intergenerational mobility studies to understand its development, which were well organized by distinct research frames and statistical methods despite some time overlaps between them. The first generation (Generation I), which began with Sorokin (1959[1927]), inquired into the degree of openness in society through investigating the distribution of social stratification and comparing its change between generations, particularly between fathers and sons (Allingham 1967; Blau 1965; Crockett 1962; Gerstl and Perrucci 1965). The class division applied in this generation of research was categorical and mainly based on occupation. By investigating inflow and outflow tables between father's and son's statuses, researchers distinguished exchange mobility from structural mobility and judged the relative openness of society through intergenerational changes. Although this line of research detects social mobility to a degree, in my view, it is descriptive and lacks causal explanation. No wider context than a son's present status and his father's in his childhood is included. It also neglects heterogeneity within the same class stratum: People located at the same level of stratification may have individual-level heterogeneity, such as education and job experience. These characteristics may mediate the influence of family background and interfere with its status transmission. Besides, the first-generation population (fathers) is not necessarily represented by the second-generation sample (sons). On the basis of information from the son's population, this is not a status

comparison between two populations of different generations, but aggregate differences of every single respondent's status and his father's.

The second generation of research (Generation II) concentrates on path models of status attainment, in which father's education and occupation affect son's present status, mediated by their education and first job (Blau and Duncan 1967). This advanced the previous research frame, as well as the methods of data analysis. The pathway concept not only implied that status attainment was a process comprised of a series of occupational statuses in turn, in spite of only containing first and current jobs in the models, but it also provided a casual argument for intergenerational mobility. At the analysis level, thanks to continuous scales of social status, the socioeconomic index (SEI), and prestige scales, as well as the statistical-diagrammatic technique of path analysis, researchers could differentiate direct and indirect effects of family background and education, respectively representative of ascription and achievement, on status attainment and further assess their relative importance to current occupational achievement (e.g., Duncan et al. 1972; Spaeth 1968).[9] This approach inspired comparative studies in many countries and prevailed in the 1970s and 1980s (e.g., Andorka 1983; Broom and McDonnell 1974; Ganzeboom and Treiman 1989; Goldthorpe 1980; Jones 1971; Portocarero 1983; Treiman and Ganzeboom 1990).

The third generation (Generation III) applies log linear and log multiplicative models to analyze mobility tables, which were initially introduced in the late 1970s (Goodman 1972, 1979; Hauser 1978, 1981) and further developed by Sobel, Hout, and

[9] The Wisconsin models of status attainment during late 1960s and early 1970s had a similar research frame and path concept of status attainment as the Blau-Duncan models did, but brought in mediating variables of social psychology, such as the significant other's influence and mental ability (for a comprehensive comparison of these two models, cf. Haller and Portes 1973). These models focused on the mediation of interpersonal influence through educational achievement on status attainment. There was a variety of this mediation in Wisconsin research (e.g., Sewell, Haller, and Portes 1969; Sewell, Haller, and Ohlendorf 1970; Woelfel and Haller 1971).

Duncan (1985) and Yamaguchi (1990). Using more advanced statistical skills that can differentiate absolute and relative mobility, this generation returned to Generation I's research question: To what extent does social mobility differ between societies? In addition, it asks whether a core pattern of social fluidity existed in most industrial countries (e.g. Featherman, Jones and Hauser 1975; Grusky and Hauser 1984; Miller 2001; Robinson 1984; Whelan and Layte 2007). Since the late 1970s through the 1980s, a large multinational project of social mobility, Comparative Analysis of Social Mobility in Industrial Nations (CASMIN),[10] was carried out, and standard scales of occupational classification (EPG scales and ISCO)[11] were constructed and used worldwide. CASMIN researchers concluded that the core model did exist in all industrial countries with some deviation because of different countries' histories, and inheritance effects, rather than hierarchical effects, were more important to explaining relative mobility between countries (Erikson and Glodthorpe 1985, 1987a, 1987b; also cf. Hout and DiPrete 2006). Although this generation of research was more technically advanced and used internationally comparative studies, log-linear models focus only on bivariate distributions between father and son, making the research scope extremely narrow (Ganzeboom, Treiman, and Ultee 1991).

The three generations share some methodological flaws. First, father's occupations in these studies conventionally refer to the father's job when the son was fifteen years old. From the perspective of career development, comparing fathers' jobs and respondents' present jobs is not appropriate, because at the time of interview,

[10] Directed by Goldthorpe and Muller (1982), the CASMIN project was conducted in 13 countries for constructing the patterns of intergenerational mobility (by 7 X 7 tables).

[11] They are accepted as standard classification of class categories in comparative studies (Ganzeboom, Treiman and Ultee 1991). The EGP scale was constructed in Erikson, Goldthorpe and Portocarero (1979). The International Standard Classification of Occupations (ISCO) was initially developed by International Labor Office (ILO) in 1969. The relationship between EGP and ISCO was analyzed in Ganezeboom, Luijkx and Treiman (1989) and later revised in Ganezeboom and Treiman (1996).

respondents are at different stages of career, as are their fathers. "As sons are in different stages of their careers at time of interview, the marginal distribution of destinations does not correspond to a real distribution of destinations in social structure" (Blossfeld 1986:211). In particular, respondents in their early careers may not reach a relatively stable social status. This comparison would underestimate destination class (son's class) and overestimate differences between generations, at least for sons who are at the early career stage (Blossfeld 1986; Mayer and Carroll 1987). Furthermore, fathers' and sons' status attainment are parallel processes that continue over time. If the father is not yet retired, both father and son would be in the same labor market and thus may be competitors. Although one's background, such as having a good education and learning environment, may affect social class attainment, treating father's education and occupation in son's childhood as a cause of son's current status blurs the actual process of status attainment for sons. Researchers need to consider the direct influence of structural changes in the labor market on individual's job mobility to understand what really happens during the process of occupational achievement. As noted above, its relative time frame based on researchers' clock rather than respondents' makes its connection to the precise historical time impossible and fails to capture information about the opportunity structure and its changes over time.

***Intergenerational Mobility in Taiwan***

Through a series of economic policies enacted during the 1950s through the 1970s,[12] the Taiwanese government worked on developing its manufacturing, and the originally surplus labor force in the agricultural sector was forced to flow into the

[12] As described in Chapter one, the economic policies of land reform (1949 to mid-1950s), import substitution (mid-1950s to 1960), and export-led industrial development (1960s to 1970s) were conducted successively after the nationalist government moved to Taiwan from Mainland China in 1949 (Cheu 1988; Hsiao 1988; Lee 1999; Pang 1992).

manufacturing sector. During that time, Taiwan was flush with a primary-educated labor force,[13] and its unique characteristics of productive organization and its semi-peripheral location in the world system also provided Taiwan a good niche with its original equipment manufacturers and subcontractors (Bosco 1992; Shieh 1992b). As a consequence, intergenerational mobility from farmers to workers is the predominant phenomenon in Taiwan, resulting from fast changes in the productive structure caused by industrialization[14] (Hsieh and Yu 1990; Sheu 1987, 1989, 1990; Tasy 1997). During the mid-1980s, the total rate of intergenerational mobility was close to 60 percent, within which structural mobility and exchange mobility accounted for 72 percent and 28 percent, respectively, and the influence of structural transformation from agriculture to manufacturing explains 84 percent of the structural mobility rate in Taiwan (Sheu 1989, 1990).

Despite vigorous structural mobility, the openness of Taiwanese society remained unchanged after structural changes were controlled (Hwang 1995; Sheu 1990). Tsay (1997) examined a national sample in 1992 and found that the association between father and son status did not decline among four age cohorts in Taiwan. The inheritance of classes without productive tools is much higher than that of classes with productive tools (Hsieh and Yu 1990; Sheu 1990),[15] for example, laborers have the greatest propensity for inheritance, followed by administrative and managerial employees, and small farmers (Sheu 1990).

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[13] Compulsory education was six years (i.e. elementary school) in Taiwan when the nationalist government came to Taiwan in 1949 and rose to nine years (primary and junior high school) after 1968.

[14] Taiwan spent 16 and 23 years, respectively, making the transformations from agriculture to manufacturing and then to service industries since 1949. The agricultural population in Taiwan labor forces was, for the first time, less than the population of the manufacturing and service industries at 1965. In 1988 the population of service industries first exceeded the manufacturing population in Taiwan.

[15] Applying latent structural models, Hsieh and Yu's (1990) findings are slightly different from those of Sheu (1990) in spite of using data collected at about the same time. The order of inheritance is manufacturing and relevant workers, farmers, bosses, and professionals and managers (Hsieh and Yu 1990).

To further investigate the components of intergenerational mobility, many studies applied the statistical skills of Generation III (i.e., log-linear and log-multiplicative models) in the frame of Generation II (Blau and Duncan's path model), and concluded that although inheritance in Taiwan was a general phenomenon, inter- and intra-generational mobility patterns are distinct from one other. Most mobility from farmers to workers occurs at the transmission from father to individual's first job. In other words, this kind of mobility induced by structural change tends to occur between rather than within generations (Sheu and Hwang 2002). Tasi and Wen (1986) further reveal that while intergenerational mobility between father and current status is fitted by a perfect industry mobility model without gender differences, gender distinctions actually occurred during the process of status attainment between them.[16] Similarly, Sheu and Hwang (2002) examine three main mechanisms of mobility and find the order of the most transferable to the least was ownership, authority, and professions for the transmission of father-to-current status, which significantly differs from the mechanisms of transmission from father to initial status and from initial to current status.[17]

### 2.2 MOBILITY FACTORS

Previous studies of social stratification provide considerable insight into factors that influence social mobility. As Rosenfeld (1992) comments, to gain a complete understanding of job mobility, researchers need to consider three factors: individuals,

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[16] For females, the mobility from father to their initial status and from initial to current status, respectively, follows a perfect industry model and a uniform inheritance model, but they are consistently fitted by quasi-perfect industry mobility models for males. In other words, males tend to inherit father's industry with a variation by industries throughout their work lives, but females are more likely to stay in their initial industries after getting influenced by their father's status. However, it ends up fitting a perfect industry mobility model without gender differences if we just investigate intergenerational mobility between father's and individual current status (Tsai and Wen 1986).

[17] The main mechanism is authority, followed by ownership for transmissions from father to initial status and from initial to current status. Hence, they concluded that managerialization and becoming petty bourgeois, but not professionalization, are main means of pre-proletarianalization in Taiwan (Sheu and Hwang 2002).

structure, and time. Emphasizing the effects on both inter- and intra-generational mobility, this review is organized by individual and structural aspects while considering their change over time. For the individual aspect, not only education, but also the change of human capital after entry into the labor market (i.e., further education) is discussed. For the structural aspect, modernization/industrialization, vacancy, labor queue, and segmentation in the labor market are reviewed.

### 2.2.1 The Individual Aspect

#### *Education*

Researchers have found that education has double-edged effects on social mobility (e.g., Blau and Duncan 1967; Featherman and Hauser 1978; Hwang 1995; also cf. for review and summaries of empirical findings: Hout and DiPrete 2006; Kerckhoff 1995). Although education transfers the advantages and disadvantages of family background from generation to generation, it is the main source of human capital by which people shed the constraint of their original class and achieve their own status. Education is also a strong predictor of job mobility (e.g., Baker, Gibbs, and Halmstrom 1994a, b; Felmlee 1982; Mayer and Carroll 1987), but its effect changes over time; it is stronger on first job than on subsequent attainment, such as promotion within firms (Bills 1988). Some research finds that its effect is attenuated by age (Blau and Duncan 1967; Featherman and Hauser 1978; Hauser, Sheridan, and Warren 1999; Warren 2001) and replaced by other job-related variables, such as job experience,[18] once entering the labor force (Blossfeld and Mayer 1988).

[18] Job experience is one kind of human capital accumulated in the labor force. It is mainly differentiated into general labor force experience (e.g., Alon, Donahoe and Tienda 2001) and firm-specific labor force experience (Carrington 1993) in research on job mobility. The former is usually defined as the length of time working since first entry into the labor market and the latter is measured either by seniority (i.e., working years) or previous jobs within firms (Baker, Gibbs, and Halmstrom 1994a; Blossfeld and Mayer 1988). Tuma (1976) further specified job experience depending on which knowledge workers may learn. "[S]ome acquired resources are job-specific (e.g., knowledge of the boss's preferences), some are

There are several explanations for education's influence on occupational attainment. Human capital theory assumes that people with high human capital have high ability and productivity, and they will receive corresponding rewards through the price mechanism in the free labor market (Mincer 1974). This idea is a simple, straightforward, sociological version of neoclassic economics (Granovetter 1981). The credential view of education argues that employers select prospective employees by diploma, not because of its association with high productivity, but because of the normal value on high education in society (Collins 1979). The job-competition perspective illustrated by Thurow (1975) argues that when competing in the labor market, the relative ranking of one's education is much more important than the absolute amount of education. Since labor queuing is a relative competition and one's ranking order in the queue is more important than his/her productivity in its absolute respect, education in this sense becomes a "defensive necessity" when other candidates are highly educated (Thurow 1975). Analyzing wage data in Taiwan from 1979 to 1998,[19] Liu and Sakamoto (2002) test these theories and reveal that at least for manufacturing industries, education displays a proxy indicator of productivity, as argued by human capital theory.

***Further Education after Entering the Labor Market***

Most research on social stratification assumes that education occurs prior to attaining the first job and remains constant afterwards, even though some researchers as early as Blau and Duncan (1967: 166-168) recognize the flaw in this assumption. Blau

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occupation-specific (e.g., skill at shorthand); and some are nearly universal (e.g., problem-solving ability and interpersonal skills)" (p. 346).

[19] Liu and Sakamoto (2002) use secondary data from *Taiwan Industrial Production Statistics Yearly Report* in 1979, 82, 85, 89, 92, 95 and 98 to obtain the indexes of industrial productivity, defined as the output per employee-hour.

and Duncan admit that about one eighth of their sample might have added to their educational attainment after entering the labor force. When a considerable proportion of people make additional investments in human capital after labor force entry, the estimated relation between regular education and occupational attainment would be highly biased. Winfield et al. (1989) find different effects of education on occupational attainment at different time points in careers[20] for American and British men. Although researchers find the association between original family background and occupational achievement to be very similar in the two counties (Erikson and Goldthorpe 1985; Kerckhoff, Campbell and Winfield-Laird 1985), when considering education taken after labor force entry, they found that education has a stronger effect on first job for Americans, but has stronger effects on later jobs for British men. Because most British men leave secondary school and gain qualifications or credentials after labor force entry through part-time education, they change jobs more often during the first 20 years in the labor force than Americans. In other words, the process by which people reach certain occupational attainment could be very different, while the pattern of intergenerational mobility investigated by social origin and education is the same between countries.

If we treat educational attainment as a factor on the supply side of the labor market, individuals' choice to continue their education after employment may reflect labor market demand. Researchers find that workers who perceive job insecurity tend to participate in work-related education (Elman and O'Rand 2002) and that enhancing human capital though occupational training helps workers increase earnings and occupational status and decrease the possibility of unemployment (Mangum and Adams 1987). In addition to part-time, post-school training, reactions to labor force demands also take the form of participating in full-time education after labor force entry

[20] They compare the standardized regression coefficients of education on occupational prestige of first job, jobs at the tenth year and at the twenty years respectively after labor force entry (Winfield et al. 1989).

(Kerckhoff 1990). This kind of further education explains, at least in part, multiple entries into the labor force and occupational mobility, particularly during the early career stage (Coleman 1984). Regular school education and further education/trainings after schooling compose one's real educational attainment. Only by taking both into account can we develop a full understanding of educational influence on job mobility and career development throughout the work life trajectory.

### 2.2.2 The Structural Aspect

#### *Modernization and Industrialization*

At the macro level, modernization theory assumes a more open society that follows a predictable succession of structural changes, from agricultural to manufacturing to service industries, in which occupations and their corresponding skills are more specialized. In this process, the role of ascription become less important, and particularism is superseded by universal norms (DiPrete and Grusky 1990; Ganzeboom, Luijkx, and Treiman 1989; Hout 1988). Although it provides a relatively dynamic perspective to investigate social mobility, as the shortage of the dual segmentation, modernization theory is so monotonic and general that it has proven to be wrong, according to the summary of contributions of RC28's (Research Committee 28 on Social Stratification and Mobility) to knowledge about social stratification in Hout and DiPrete (2006:8). Worldwide, changes in social mobility and inequality by modernization do not always occur in parallel with its predications (Grusky 1983). For example, some social democratic countries, such as the Scandinavian countries and the Netherlands, have more social equality than other, more modernized countries (Hout and DiPrete 2006).

Similarly but more specifically, Featherman, Jones, and Hauser's (FJH) (1975) hypothesis suggests an international convergence of social mobility through

industrialization and assumes similar patterns of circulation mobility existing in industrial societies despite the different types of absolute mobility investigated. Industrialization theory in social stratification has been widely confirmed in Generation III social stratification research (e.g., Grusky and Hauser 1984; Miller 2001; Robinson 1984; Whelan and Layte 2007). Erikson and Goldthorpe (1987a, b, 1992) further develop a core model of social fluidity to test the hypothesis and accept a weak version of FJH's hypothesis that there is a common but not identical pattern of relative mobility with some deviations for individual European countries and Japan (Erikson and Goldthorpe 1992:343-352; Ishida, Goldthorpe and Erikson 1991). In addition to Japan's case, the FJH hypothesis is also supported by the experience of such East Asian countries as Hong Kong (Chan, Lui and Wong 1995) and Taiwan (Tsay 1999).

***Vacancy Theory and Labor Queue***

From the perspective of demand on employment, vacancy theory explains incomplete equilibrium in the labor market, in which workers with similar characteristics earn different rewards and benefits. It argues that there is no job mobility without job vacancies in the labor market, and the potential incumbent of a vacancy is recruited either from current employees on other positions or from people outside the system, such as new entrants in the labor market. As Sorensen states (1977:966):

> Persons can move only to a slot that is available, i.e., vacant, and while a person's "productivity" (as measured by ability, education, and experience) determines which slots a person gets access to, the distribution of attainments reflects the distribution of slots, not the distribution of personal attributes that are relevant for getting access to slots.

The basic assumption in the vacancy theory is that rewards, income, and occupational status are attached to positions, not to human beings. By constructing vacancy chain models, researchers simulate job mobility in a relatively close system of

labor market in which the prerequisite of one's movement is the availability of vacancy and a series of job changes creates a chain of vacancies in the system as soon as a job move begins (Smith 1983; Sorensen 1975, 1977; Stewman and Yeh 1991; White 1970). Since the availability of vacancies at higher levels of positions, rather than enhancing one's productivity is the key to ascending, people who change jobs wait until better positions are available, and thus they can control the direction and the timing of their mobility to some degree (Sorensen and Kalleberg 1981). Vacancy theory also provides a reasonable explanation for why there is a time lag to attain a corresponding status after people increase their human capital.

***Segmentation in the Labor Market***

Structuralists challenge the labor market homogeneity assumed by neoclassic economics. New structuralism in social stratification, originally labeled by Baron and Bielby (1980), focuses on heterogeneity in the labor market and its impacts on individuals' employment and job mobility. The dual economy and labor market segmentation are two main concepts of new structuralism (Tolbert 1982). Both assume that the labor market is not a single, homogeneous field, but rather is composed of several heterogeneous sectors, each with various working conditions, reward systems, and types of employment. Regardless of whether it is defined by industrial or job-related characteristics, the division of industries or sectors, usually in a dual scheme, hinders total competition and free mobility in the labor market.

On the one hand, initiated by institutional economics, the dual economy focuses on economic and industrial segmentation. Tolbert's typology (1982:461), for example, is composed of three sets of industrial indicators: "economic scale (assets, profit, and the like), product market strength (concentration), and the labor market (turnover, unionization, earnings among others)." The division of "oligopolistic/core" and

"competitive/periphery" sectors is assumed to have a relationship of exploitation, and the wage differential occurs among different segments of industries (Beck, Horan, and Tolbert 1978; Bluestone, Murphy, and Stevenson 1973; Horan, Beck, and Tolbert 1980; Lord and Falk 1980; Reich, Gordon, and Edwards 1973; Tolbert, Horan, and Beck 1980). In contrast, labor market segmentation observes a separation among sectors using a wider range of factors, such as occupational division and diversity of organizations, as well as different employment and working conditions. Blossfeld and Mayer (1988), for example, use firm size (less than 50 people/ 50 or higher) and the degree (low/ high) of job qualification (skills) to operationalize segmentation. Likewise, Sakamoto and Chen (1991a) construct a typology by combining the division of industrial and labor market segmentation. Their dual labor market is specified by four standards, professional and managerial occupations, unionization, oligopolistic industries and extremely large establishments with 1,000 or more employees.

Briefly, the components of segmentation are ordinal, where jobs are good in the primary/core sector compared to those in the secondary/peripheral sector (Doreinger and Piore 1971; Tolbert, Horan, and Beck 1980). The return to schooling in terms of occupational achievement and wage determination is also mediated by segmentation in the labor market (Beck, Horan, and Tolbert 1978; Sakamoto and Chen 1991a, 1991b; Sakamoto and Powers 1995). Employment in the secondary sector tends toward complete competition by the price mechanism, as neoclassic economics assumes. Laborers bid on jobs, and employers continue to hire until the marginal benefit of having one more worker is equal to the cost of hiring this worker (Sorensen 1994:506). Contrarily, potential workers would like to wait for primary-sector jobs because this sector offers better working conditions and rewards. Therefore, some non-price mechanisms, such as queuing, are involved in hiring (Sakamoto and Chen 1991a; Sakamoto and Powers 1995).

In addition, the requirements of some specific human resources, such as high skills or professional knowledge, also limit employment in the primary sector to a narrow range of prospective employees (Doeringer and Piore 1971).

The constructed typology of segmentation suggests that the dual labor market's operation involves two kinds of mobility: within and between sectors. Both industrial and labor market segmentation hypothesize that there are hindrances to mobility between sectors, and therefore, most discussion emphasizes distinct mechanisms of employment within sectors (Beck, Horan, and Tolbert 1978; Doreinger and Piore 1971). Researchers find a certain amount of inter-sector mobility, but with patterns that are distinct from mobility patterns within sectors (Blossfeld 1986; Mayer and Carroll 1987). Blossfeld and Mayer (1988) find that human capital has different effects on inter-sector as compared with intra-sector mobility. Education has a protective effect for workers in the internal labor market against entering the external labor market, but regarding mobility within the internal labor market, the effect of education is replaced by that of labor force experience.

***Critique and Solution of the Dual Approach***

Although the segmentation approach highlights the importance of labor market heterogeneity for understanding social stratification outcomes, it also has several theoretical and methodological problems. First, despite the extensive use of this approach during 1970s to 1980s, there is no consensus about the economic or labor market characteristics that appropriately define segmentation. Because this approach uses descriptive and narrative arguments, rather than theoretical and causal ones, the findings about the existence of a dual structure diverge and the relationships between the components of segmentation have never been clearly laid out (for detailed critiques of the dual approach, cf. Hodson and Kaufman 1982; Zucker and Rosenstein 1981). Second, combining industrial, occupational, and organizational structures in a typology is highly

confusing when trying to identify the real factors constructing segmentation and their actual influences on labor market outcomes among its components. As Baron and Bielby (1980, 1984) criticize, segmentation theory blends many structural characteristics of organization, and because organizational structures primarily vary among different industrial and labor market segments, distinct organizational structure, usually using firm size[21] as a proxy, may be the main explanation for labor market heterogeneity, rather than industrial or occupational divisions in the labor market.

Furthermore, the approach implies a parallel between the core and peripheral sectors, good and bad jobs, and primary and minority groups, assuming that each component of segmentation consistently possesses characteristics on various dimensions of the economic and labor market structure. For example, it uses monopolization and large firm size to construct the primary/core sector and then assumes that good jobs, high wages, and low layoff, to name a few, consistently happen in the sector and the total inverse does in the other sector. As a consequence, the operationalization of segmentation and the demonstration of its connection to labor market outcomes often are mixed with cause and outcome variables and easily entangle researchers in problems of circularity (Hodson and Kaufman 1982; Kalleberg and Sorensen 1979; Tolbert, Horan, and Beck 1980). Finally, because there are no definite theories to follow, some endogenous or unmeasured characteristics that are not taken into account but actually affect people's choices of entry into specific sectors may bias the results of wages or other labor market outcomes imputed to labor market segmentation (Cain 1976; Heckman 1979; Jencks 1980). Besides, without considering people who are not in the labor market (e.g., those

[21] Although Baron and Bielby (1980, 1984) use a more detailed measure of organization, including organizational technology, product diversity, scope of product market and organizational autonomy, they find that firm size is the strongest indicator of organization structure. Relevant research also identifies firm size as a primary characteristic of organizations that seriously influences labor market outcomes (Kalleberg and Buren 1996; Petersen and Morgan 1995; Villemez and Bridges 1988).

who have never worked or are unemployed) estimations of models with segmentation also tend to be biased as a result of nonrandom sample selection (Heckman 1979).

To deal with critiques of the typology of segmentation, some researchers utilize certain statistical techniques (e.g., factor analyses or cluster analyses) to differentiate characteristics of multiple dimensions in labor markets to construct segmentation (Kaufman, Hodson, and Fligstein 1981; Oster 1979; Tolbert, Horan, and Beck 1980; Weakliem 1990). To avoid a circular argument, researchers give up the assumption of strict parallelism between economic sectors and labor market conditions, as suggested by Baron and Bielby (1980), and allow variations on organizational structure and labor markets within the dual economy. More importantly, they explain results of labor markets outcomes by segmentation from the perspective of resources: that workers in different sectors could apply structural resources to defend or improve their situations (Kalleberg, Wallace, and Althauser 1981; Wallace and Kalleberg 1981). The latest research incorporates more concrete and concise standards, such as employment status (Amuedo-Dorantes 2000), standard/nonstandard employment (Kalleberg, Reskin, and Hudson 2000), and having an employer who pays poverty-level earnings and offers neither a pension nor health insurance (Allen, Clark, and McDermed 1993; Hudson 2007) to mark the quality of occupations, serving as the differential between segments in the labor market. Considering time and life-course factors, researchers are also sensitive to changes in the degree of segmentation and its influence on individual employment over time (Hudson 2007; Reid and Rubin 2003).

With respect to addressing selection bias, researchers apply more advanced statistical techniques, which predict the probability of a worker's selection into either sector by endogenous variables and estimate the investigated functions containing the predicted probability of individual selection at the same time or in a two-stage procedure

(cf. Heckman 1979, 1990). Sakamoto and Chen (1991a, 1991b), for example, use endogenous switching regression models and reject the influence of selection bias on dual labor market outcomes. Other research affirms the existence of segmented labor market with significant selection bias (for the United States, see Dickens and Lang 1985; Gyourko and Tracy 1988; Osberg et al. 1986; for Taiwan, see Hou 1993; Tan 1998; Tan and Yu 1996).

***Segmentation in Taiwan's Labor Market***

Relevant research utilizing the dual approach in Taiwan encounters similar problems, and the findings are contradictory as well. Investigating manufacturing industries, some research indicates that Taiwan has an integrated and totally competitive economy without institutional interference from the government (Chang and Wu 1983; Fields 1992; Wu 1984), while Tseng (1998) finds a core/peripheral division by constructing a cluster analysis of 12 economic indicators collected for 49 industries during the early 1990s. Following the approach of segmented labor markets, other studies consider not only industrial attributes, but also a wider range of factors, such as workplace conditions, wages, and returns to schooling, and find support for the existence of segmentation in Taiwan's labor market (Chang, Parcel, and Mueller 1988; Hwang 2001a; Liu and Liu 1988; Tan 1998; Tan and Yu 1996).

Despite inconsistent findings of segmentation, researchers are in consensus about the separation of employment and wages between public and private sectors in Taiwan (e.g., Hou 1993; Hsin 1988; Hwang 2001a, b; Liu and Liu 1988; Tan 1998). Researchers find that the private-sector labor market is approximately totally competitive and highly influenced by labor production capacity and price in Taiwan (Change and Wu 1983; Wu 1986), while public-sector wages are determined by the governmental budget and have a leading effect on private-sector wages through influencing the consumer price index

(Hsin 1988). People working in the public sector receive better rewards at various occupational levels (Hou 1993; Liu and Liu 1988; Wu 1986) and enjoy higher status, sounder fringe benefits and pensions, and more job security compared to their counterparts in the private sector (Gates 1987; Hwang 2001a). Hwang (2001b) studies career achievements within multiple labor markets in Taiwan, which were operationalized by income as well as objective and subjective occupational statuses. He concludes that working in the public or private sector is a very important part of subjective identification of social status among the Taiwanese. In addition, taking selection bias into account, Tan (1998) reveals that relative to the private sector, the public sector has less wage discrimination based on gender, but higher percentages of gender wage differentials resulting from gender discrimination in the advancement to professional positions.

Initial attainment in the public or private sector also leads to different patterns of mobility. Because governmental bureaucracy contains a series of job ladders with definite standards of promotion, the labor market in the public sector has characteristics of internal labor markets (Grandjean 1981), where education, seniority, and level of entry into the hierarchy can well explain the current level of positions in the bureaucracy (Chang 1988). National examinations of civil servants in Taiwan are so competitive that people with high levels of education tend to be selected, and a very high proportion of people stay in the same place once they obtain a position in the public sector.[22] Contrarily, in the private sector, job mobility between firms occurs much more often than intra-firm mobility because of many small and medium enterprises (SMEs) and family enterprises in Taiwan (Chou 1989; Hamilton and Biggart 1988; Wong 1985). Moreover, many small enterprises offer low wages and provide hardly any fringe benefits and

[22] According to Hwang (2001b), 70 percent of individuals whose first job was in the public sector remain in that sector.

pensions for employees. Some of them are too small to be controlled by the regulations of the government. As a result, self-employment becomes a significant alternative of upward mobility in Taiwan especially for low-skilled workers (Yu and Su 2004). Besides, the dream of owning one's own business, i.e. the property possession and work autonomy, also makes self-employment prevalent in Taiwan (Hsung and Hwang 1992; Suen and Hwang 1994; Shieh 1989).

## 2.3 From a Life Course Perspective to Investigating Intra-generational Mobility

Previous studies of social stratification have provided plenty of insights about structural and exchange mobility between generations. However, this understanding of social mobility pertains to a narrow time frame (i.e., father's status conventionally defined over son's age of 15, son's first job, and the current status). Comparisons between these points of time were insufficient without considering the context of each respondent's process of career development. Except for the statuses of first entry into the labor force and of "the present," the time data collection terminated, orthodox research on social stratification offered no additional understanding about what happens "in between" regarding job and class mobility, and how mobility is affected by individual and structural changes over time. Most importantly, the heterogeneous mix of career stages that each respondent currently occupies, which mediates the attainment of a destination from the original status, seriously distorts investigations of their relationships in previous research.

While taking individual and structural characteristics into account enriches social mobility research, much research on social stratification still overlooks the time aspect, including one's previous job history and structural changes of labor market. As a result of the lack of longitudinal data and the complication of connecting changing structure to

individual job transitions, only some research concurrently handles the influence of job history, personal life cycle, and macro-structural change on occupational mobility (e.g. Blossfeld 1986; Mayer and Carroll 1987; Shin 2007). Blossfeld (1986) reviews existing theories of job mobility and concludes that none of them is really dynamic: They are either "static" or "semi-static." Path analyses of status attainment theory, for example, assume a constant mobility rate influenced only by education, first job, and other background variables, and every position in the labor market is available to everyone who has qualified ability. This is a static model that does not consider the real process of occupational status changes. Vacancy theory reveals that employees hold their jobs until better jobs are available. Although it implies a tendency of upward mobility, vacancy theory assumes that only economic fluctuation (e.g., expansion or contraction) generates a constant rate of vacancies among all levels of hierarchy. This is a semi-static model of job mobility.

Since the process of status attainment in industrial society takes the form of job shifts, researchers are increasingly turning their attention to intra-generational transitions and analyzing the process of status attainment on the basis of job histories over the lifetime (e.g., Blossfeld and Mayer 1988; Carroll and Mayer 1986; Sorensen 1975; Tuma 1976). This line of research applies dynamic/event history data analyses to investigate changes in transition rates of job mobility by controlling relevant individual and structural covariates. Using information about each job an individual holds heretofore, this approach fills in the blank space between first and current attainment in previous research and makes it possible to connect each job episode to the corresponding labor market structure. Since event history analysis places social mobility in the context of continuity of career mobility over a lifespan, Mayer and Tuma (1990) identify it as being part of life-course research. During the long period of a lifetime, an individual's career

development parallels the process of the life course, and both are embedded in the changing structure of opportunities and societal development. The time aspect is an important consideration for researchers addressing this issue. How to incorporate these factors and to investigate the interactions between them is crucial, and this is the main subject of the present research.

### 2.3.1 Time Dependence of Intra-Generational Mobility

The effects of time on job mobility are related to the nature of job shifting that researchers assume. Early research applies the theory of Markov processes to generate the probabilities of job mobility (Feller 1968). Many states are part of this process, and the probabilities of transitions between these states are assumed to be stationary and only affected by the conditions of current state, not by previous movements or past history. It also assumes homogeneity of the population (i.e., everyone in the population is subject to the same set of probabilities). McFarland (1970) criticizes that previous job history influences rates of later mobility and that mobility rates decline over time. Heterogeneity in the population produces non-stationary probabilities, which run counter to the assumption of a Markov chain. In addition, there is cumulative inertia (Sorensen and Tuma 1981; Tuma 1976) and age dependence (March and March 1981; Mayer 1972) in the process of job changes. Therefore, the duration dependence of job mobility is generally expected and also found to be negative over time: The longer an individual stays in a job, the lower probability that he/she leaves this job (e.g., Flinn 1986; Granovetter 1986; March and March 1981). However, the duration dependence of job change may be different for females. The transition rate of the first job for young women declines over time and then increases, probably because there are more expectations of family responsibilities for women (Donohue 1988).

Also, frequent class shifting tends to happen during younger ages, suggesting an age dependence for class mobility. Konig and Muller (1986), for example, study men's career mobility in West Germany and France during 1965 to 1970 and find a clear age dependence of class mobility. The incidence of class mobility declines by age.[23] Age, labor force experience, and job tenure, however, are strongly correlated on the process of intra-generational attainment. It is difficult to isolate the effects of duration and age dependence (Rosenfeld 1992:52-53; Sorensen 1977). Moreover, when cross-sectional data are used, age effects are usually equivalent to reverse effects of birth cohorts. In that case, the age dependence of job mobility indicated in the results may not be explained as the inner time dependence of career mobility, but rather as a tendency of openness changing over time in a society. In other words, the finding of age dependence may actually imply that the more recent cohort has more opportunities to change jobs.

The parallel processes at the macro level (e.g., national development and economic cycle) change the opportunity structure and further influence a person's decisions to change jobs over the lifetime. For example, Blossfeld (1986) specifies the cohort and period effects of labor market to indicate the impacts of structure on mobility at the time of first entry into the labor force and at each time of job change, respectively. He finds that in Germany, people who started their careers during a recession or when the country was less modernized, have a lower initial status and then move upward more quickly than people who begin their careers during times of the opposite structural conditions, and vice versa. Different from the long-term influence of the cohort effect, the period effect displays impacts of short-run equilibrating forces at the time of job change. A depression, for example, may cause people to be laid off, and an economic boom could

[23] Age is broken down by 15-year intervals. The proportion of class mobility for men in Germany is 12 percent, 9 percent, and 5 percent in age ranges, 20-34, 30-49, and 50-64, respectively. For France, the proportions are 30 percent, 14 percent, and 8 percent (Konig an Muller 1986).

lead people to quit for better jobs (e.g., Burda and Wyplosz 1994; Burgess and Rees 1996; Diprete and Nonnemaker 1997; Gregg and Wadsworth 1995). Blossfeld's (1986) research demonstrates that "the attainment process is time-dependent in a threefold sense. It depends on time spent in the labor force, depends on the historical time of entry into the labor market, and it depends on the actual historical time" (p. 208).

### 2.3.2 Career Stage and Life Course

Among the different clocks running on the process of intra-generational mobility, career stages are probably the most obvious dimension of career development. Starting at the beginning of the first full-time job after leaving schooling for the last time (Featherman and Hauser 1978),[24] the early career period usually occurs over the transition from adolescence to adulthood and is characterized by job instability and insecurity (e.g., Booth, Francesconi, and Garcia-Serrano 1999; Kruger and Levy 2001; March and March 1981; Shavit, Matras, and Featherman 1990; Sorensen 1975). During the first 10 years in the labor market, for example, a typical U.S. worker has seven jobs, approximately two thirds of total jobs in his or her lifetime (Topel and Ward 1992).[25] Multiple entries and exits from the labor force for further education, job searching, and other non-life-course reasons are also characteristic of this period (Kerckhoff 1990; Topel and Ward 1992). Compared to middle-age workers' reasons for job changes, young people are more likely to be irritated with repetitive jobs (Bartel 1982)[26] and to look for

[24] As criticized in the section of further education after entry into labor market in 2.2, this definition of career ignores the facts that some people take full-time jobs and schooling at the same time, or return to schooling after working full-time for several years. Oppenheimer and Kalmijn (1995) also identify a moratorium period full of stopgap jobs during the overlap between schooling and a formal career.

[25] Similarly, Booth, Francesconi, and Garcia-Serrano (1999) found that half of jobs in the lifetime are held within first 10 years in the labor market for British case.

[26] For older men, fringe benefits and pension are more important than wages. Because they are related to the cumulative experience and seniority, these benefits make people stay (Bartel 1982).

jobs that fit their interests with less consideration for income returns (Oppenheimer 1974).

Despite frequent job mobility in the early career, in the long run, people tend to have an inner consistency of status (Form and Miller 1949; Hall 1982). After trying some brief work during the early career, people settle into a job with a better match, and job tenure becomes more durable as the career progresses. Hall (1982) criticizes that existing findings about job tenure are biased and under-estimated because they do not consider career stages. Burgess and Rees (1996) also find a dualism of very short (transient) and very long (lifetime) jobs[27] coexisting in the British labor market. This is probably because most researchers ignore the importance of career timing in intra-generational mobility. Combining the information of people in different birth cohorts and various career stages, these statistical analyses of job mobility create an illusion that careers are extremely unstable in modern society. Current theories of job mobility do not explicitly test the general concept of career development, in which people settle into relatively stable jobs after a period of job shopping in the early career, and then hold the jobs for quite a long time unless there are significant changes in individual, structure, or life course conditions. Although event history analyses pay more attention to job transitions, they treat every transition in the job history as an identical episode and seldom consider the effects of its timing on different stages of an individual's work life. This is probably the reason why some research detects a negative tendency induced by unobserved heterogeneity, interwoven with the duration dependence of job mobility (Blossfeld and Hamerle 1990; Congdon 1985).

In addition to time dependence of intra-generational mobility as such, processes of other life domains are parallel and interact with the process of career development as

[27] They estimate that more than 40 percent of men in 1990 were in jobs that will last 20 years or more (Burgees and Rees 1996).

well. For example, changes in marital status or family life cycle, which bring different responsibilities and roles in the daily life, may affect people's career decisions. Significant life events that happen at a certain point in time also switch one's career development; the timings of entry into marriage (Sorensen 1983b) and childbearing (Drobnic 2000), for example, highly affect women's career patterns. In particular, most life course role demands are gender-specific. Hence their influence on intra-generational mobility seriously differentiates between genders. In contrast to men' sharp decline in leaving by seniority, for most career reasons, women are more likely to quit for family reasons no matter how long they work within a firm (Peterson and Spilerman 1990). Getting married stabilizes men's careers by decreasing job mobility, while entering motherhood is negatively correlated to women's socioeconomic status (Sorensen 1983a) and makes them more likely to move from standard to nonstandard employment (in the United States, see Felmlee 1982, 1984; for the Japan and Taiwan cases, see Yu 2001b, 2002, 2004).

## 2.4 SUMMARY

While social inequality and the degree of openness in a society are the main concerns, studies of intra-generational mobility are more interested in the dynamics of career development in which people struggle and adapt themselves to changes in the opportunity structure and the life course via job transitions. Previous literature provides much insight, enabling me to construct a relatively integrative frame of research. With an awareness of the interactions among individual, structural, and other important, aforementioned parallel processes of the life course, this study focuses on the importance of career stages and attempts to fill the lacuna in existing analyses. Compared to the chronic changes in social stratification between generations, intra-generational mobility happening within a relatively short period time "has great potential to add to our

understanding both of individual's career development over their lives and of the nature and effects of career opportunity structures" (Rosenfeld 1992:40).

# Chapter 3: Research Design

Career development is a complicated process. To study status attainment throughout a lifetime, one needs to inspect the nature of time dependence of career development and to carefully consider the interactions between individuals and structural environments. This research aims to unravel these complexities and to identify mechanisms of job change and class mobility via a period-specific investigation of careers. At the individual level, I focus on the role of first job and class, the effects of changing human capital after schooling (i.e., further education and labor force experience), and life-course influences (including the timing and ordering of significant life events) on subsequent career mobility. At the structural level, the effects of segmentation and dynamic structure in the labor market are taken into account. This chapter presents the research setting in detail. Section 3.1 introduces the individual and structural data examined and presents the critical definition of job change, followed by the main research questions and basic assumptions. Section 3.2 explains the measurement of class scheme and time-constant and time-dependent covariates on aspects of individuals and structure in this research. The construction of segmentation and time-varying structural indicators are illustrated as well. Section 3.3 discusses the main hypotheses derived from relevant theories. Section 3.4 demonstrates the hazard rate models applied and handles the problem of selection bias caused by heterogeneous treatment effects in the analysis of segmentation in the labor market.

## 3.1 INTRODUCTION TO FOUNDATION OF THE RESEARCH

### *Data*

The individual data come from "The Survey of Social Change: The East Asian Society," carried out by the Institute of Sociology of Academia Sinica in Taiwan in 1996. This survey provides a retrospective, cross-sectional dataset representative of the Taiwanese population ages 25 to 60 in 1996 (i.e., 1936 to 1971 birth cohorts). There are 1,452 males and 1,379 females in the total sample of 2,831 respondents, comprising 7,360 job episodes over the lives of these respondents after data cleaning. The sample represents the population in terms of racial and social strata. Collected through standardized interviews, the data include detailed information of each occupation that interviewees have ever held, with exact reference to respondents' ages. In addition, the data include relevant information in other life domains, including schooling and further education, family formation, and parenthood.

Macro data of structural change in the labor market are taken from the National Statistics of The Directorate General of Budget, Accounting and Statistics (DGBAS[28]) of Executive Yuan in Taiwan from 1953 to 1996. Because intra-generational mobility covers a long period of time and there has been very rapid economic development in Taiwan since the second half of twentieth century, I collect 9 important annual indicators of industrialization and economic cycles to simulate changes in Taiwan's opportunity structure. The detailed information is described later. In addition, information regarding Taiwan's labor force presented in this research comes from statistical results of the

[28] DGBAS, founded in 1931, is a cabinet-level office that handles most duties of the nation's Comptroller's Office and Census Bureau. Many national statistics and indicators can be traced back to the 1930s.

Manpower Survey, which DGBAS conducts monthly to understand changes in the labor supply and the status of employment in Taiwan.

***Critical Definitions and Career Discontinuity***

A job change in this research refers to a job shift between firms or institutions since the first formal job after schooling.[29] Because the data cover respondents' entire job history, we need to differentiate between formal jobs ending for another job and those that result in individuals leaving the labor market. Career discontinuity might cause individuals' work skills and career resources to decline (Blossfeld and Huinink 1991), and thus the previous accumulation of work experience and prestige may not be reflected in the status attainment of reentry into the labor force. Hence differentiating between the two types of career discontinuity is important when investigating class mobility. Considering that the process of job change may involve a short period of time for searching or transition, job discontinuity in this research refers to the job ended with no subsequent job attainment for more than one year.[30] By this definition, about one fourth of females' jobs are ended with leaving the labor force, compared with only 5.63 percent for males in the sample. In addition, the term, "initial" class or "initial" status, used in this research refers to an individual's class or status when he/she first enters into the labor force, but the term, "first" class, refers to the first class position one attains in the beginning of a specific period. For example, first class after re-entering into the labor force from the military is the first class position people attain after discharging from CMS.

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[29] The judgment of which one is the formal job after school is left to respondents' discretion.

[30] This definition is also confined by data limitations. Because the starting and ending time of every job spell is recorded using respondents' ages in the data and Chinese like to report nominal ages, we cannot differentiate whether one year of age between two consecutive jobs actually means continuous careers or results from age rounding. Hence, job discontinuity in the research is operationalized as at least two years of unemployment since leaving the last job.

### *Research Questions and Assumptions*

This project aims to develop a better understanding of how to respond to the following questions. Do different career stages exist during the process of status attainment, and are they characterized by distinct paces and patterns of job mobility and class mobility? Do job and class mobility interact specifically among different career stages; in other words, does their relationship differ by the change of career stages? How are the trajectories of career mobility guided by different structural segments in the labor market, and do job changes within and between them interact with the time dependence of career mobility? My basic assumption is that people attain their current status via changing jobs at different levels in the occupational structure. In other words, the process of status attainment consists of a sequence of statuses based on the occupations a worker has ever had. This assumption is similar to that in some job mobility research. Sorensen (1975:45), Spilerman (1977), and Tuma (1985) all argue that rewards are attached to job positions and a more significant change in rewards results from job changing than from staying in a given position. While job mobility includes job changes between firms and within firms, because of data limitations this project focuses only on inter-firm job mobility, which is the main type of mobility in Taiwan.[31] Five organization covariates pertaining to opportunities and experience of promotion are included to provide information about job history within firms.

With respect to the relation between father's status and one's status attainment, I assume that people's educational achievement and their first job account for most of the influence of family background on his/her career development in modern society. Hence,

[31] As mentioned earlier, mobility between rather than within firms prevails because of a high proportion of SMEs and family enterprises in Taiwan. Previous research also shows that most job mobility happens through transitions to other firms, and not within firms. In Blossfeld and Mayer's (1988) research, only 14.7% of job changes took place within the firm, and 84% of all job transitions occurred through the market in the traditional sense.

the initial/original status of a person is the class at the time of first entry into the labor force, constructed by his/her first job, and not by father status in his/her adolescence. The conventional measure of family background is father's occupational status when the respondent was 15 years old. From the perspective of career development, however, fathers' status is also changeable during the individual's life course. Although fathers are usually at mid-career when the child is 15 years old, and thus their status should be relatively stable, the age when people have a 15-year-old child depends on how early people get married and enter into parenthood. In addition, this measure is not constant for different children in the same family because a father could have different occupations at the time points when different children reach age 15. This research only focuses on the process of status attainment within individuals' work lives and will not discuss the status difference from their parents'. Covariates of family background are included in this research only as statistical controls.

In regard to time-dependence of career mobility interwoven with effects of job duration, birth cohort and age, I handle this complication in two ways. First, while the sample analyzed in this research is a cross-sectional dataset, by controlling for an individual's birth cohort as well as the time he/she first enters the labor force via including the cohort effects of labor market conditions in models, this research is capable of locating one's career precisely in the historical time. And the time a person spends in the labor market is further specified by career stages. Through these ways, this research aims to reveal the time-dependence of career development. Although job change may also be correlated with age dependency, in that younger people may change jobs more often than older ones, this research assumes that no matter at what age people start their careers, at least at the aggregate level, people experience time dependence of career

development, characterized by distinct paces and mechanisms of transition among career stages, with some variations on the length of the early and searching period.

### 3.2 MEASUREMENT

Two types of covariates are specified: time-fixed covariates, which refer to the characteristics assumed to be constant within a job spell, and time-varying covariates, which are attributes that could change values during job episodes. For these covariates, the technique of episode splitting is applied to mark the time point of the occurrence of change, and different values are assigned to the covariates hereafter. I will explain episode splitting in detail later. Table 3.1 presents definitions of independent covariates listed by individual/structure and time-fixed/-varying characteristics. Their application may be adjusted in different models.

Table 3.1 Independent Covariates by Individual/Structure and Time Dependence Characteristics

| Covariates | **Individual** | **Structural** |
|---|---|---|
| **Time-fixed** | Gender<br>Birth cohort<br>Educational Cohort<br>Father's Occupation<br>Ethnicity<br>**Education Achievement**<br>1.schooling year<br>2.college degree<br>**Job History**<br>First job<br>First class/prestige of first job<br>Number of previous jobs<br>**Experience/Time Dependence**<br>General labor-force experience/ Career time | **Sector**<br>Public sector<br>Large firm<br>**Organization**<br>Promotion experience<br>Promotion opportunity<br>Importance of seniority<br>Recruitment<br>Job security |
| **Time-varying** | **Education Achievement**<br>Further education after schooling<br>**Life Event**<br>Marriage<br>Parenthood<br>**Experience/Time Dependence**<br>Firm-specific labor-force experience/<br>Duration effect | **Labor Market Condition**<br>Cohort Effect:<br>CE1.industrialization<br>CE2:economic cycle<br>Period Effect:<br>PE1:industrialization<br>PE2:economic cycle |

### 3.2.1 Individual Covariates

***Time-Fixed Covariates***

*Gender*: 1 for men, 0 for women.

*Birth Cohort*: three birth cohorts: 1936-1951(as the reference group), 1952-1961, and 1962-1971.

*Educational Cohort*: 1 for people born after 1956, and 0 otherwise. Because compulsory education in Taiwan was elevated to nine-years of schooling from six years beginning in 1968, people born after 1956 enjoy an upswing of educational achievement.

*Father's Occupation*: three dummy covariates indicate four categories of father's occupation: farmers (as the reference group), owners (including self-employed), white-collar workers, and blue-collar workers.

*Ethnicity*: coded 1 for Mainlanders, 0 otherwise including Aborigines and Taiwanese.[32]

Educational Achievement:

*Schooling in Years*: number of years of schooling attained.[33]

*College Degree*: 1 for educational achievement of a college degree or more, 0 otherwise.

Job History:

*First Job*: a dummy covariate, coded 1 for first job, 0 otherwise.

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[32] Taiwanese include Fukkien and Hakka, who emigrated from the Chinese mainland much earlier than Mainlanders. Most Mainlanders moved to Taiwan during the 1945-1949 period.

[33] Taiwan's educational system is similar to the U.S. system. The corresponding years of education achievement are elementary school for 6, junior-high school for 9, senior-high school for 12, graduation from university for 16, and graduate school for 18. The questionnaire asked respondents to report the exact years of education they attained.

*First Class/ Prestige of First Job*: two covariates about initial class position. A dummy variable indicates the individual's initial class, and the prestige score of first job marks the starting level of occupational status in careers.

*Number of Previous Jobs* not only indicates the history of job changes, but also refers to one's personal tendency for job mobility in the labor market. The maximum number of previous job changes is limited to eight because of data constraints.

Experience/ Time Dependence:

*General Labor Force Experience/ Career Time*: working years from first entering the labor market to the beginning of a job spell. This definition is conventionally used as a proxy for general labor-force experience, which assumes that one's work ability and skills increase with time in the labor market. In this research, it also indicates the time spent on careers at the beginning of a job spell.[34]

***Time-Varying Covariates***

Controlling for time-varying covariates and detecting the influence of their changes on career development are important when a job spell can last for years. Four time-varying characteristics of individuals are investigated in this research. Some represent qualitative changes, such as marital status; others are continuous measures representing quantitative changes.

Education Achievement:

*Further Education after Schooling*: coded 1 beginning with the time after undertaking further education, 0 for none or before further education. As discussed in Chapter Two, further education is a significant way that people can

[34] Some research on job mobility, such as Blossfeld (1986), uses this covariate to test the life-course effect in the labor market, in other words, the effects of the amount of time spent in the labor market.

change their human capital of their own accord after schooling. This covariate is included to dynamically detect the importance of this variable, which often has been ignored in previous research.

Life Event:

*Marriage*: coded 1 beginning with the time after getting married, 0 otherwise.

*Parenthood*: coded 1 beginning with the time after entering the parenthood, 0 otherwise.

Experience/ Time Dependence:

*Firm-Specific Labor Force Experience/ Duration Effect*: measured as the number of working years within a firm/institution until the year before job change. It assumes one's skills and knowledge regarding jobs in specific firms increase with time holding the jobs. Compared to the time-invariant measure (i.e. general labor force experience), firm-specific experience is more sensitive, because it captures the experience accumulated within a job spell, especially for workers who do not change jobs often. This definition provides a rigorous measurement of the labor-force experience for filling in the missing information within job spells. Moreover, this covariate approximates the duration of job spells. In models that do not specify the original parametric distribution of transition rates (e.g., Cox models), this covariate can be a proxy for the duration of job spells and help us detect the time effects of holding a job on transition rates of job mobility.

***Episode Splitting***

To capture the change of individual and structural characteristics during job spells, I apply the technique of episode splitting. Taking marital status for instance, a job episode spanning the date of marriage is split into two sub-episodes, and then the value of the dummy covariate for marital status changes from 0 to 1 to indicate the qualitative

change in marital status in the models. The same technique can also be applied to handle covariates undergoing quantitative changes. Job spells, for example, can be split into one-year intervals to indicate the firm-specific labor force experience, defined as the number of years working within firms until one year before a job shift. While there are a multitude of sub-episodes after arranging the data in this way, the numbers of events that actually end in particular destinations investigated in this research do not change. The inflation of the size of the sample in this manner does not affect the parameter estimates or their standard errors, as the product of the likelihood over all sub-episodes is equal to the total likelihood of the data.[35] The advantage of this method is that researchers can detect the exact time of changing values of covariates and further investigate its subsequent effects on the rates of job shifts, allowing a time lag between the cause and its outcome. In particular, when testing the hypothesis derived from human capital theory that investment in human capital brings corresponding rewards, previous research usually ignores the time lag in between, and thus it becomes a hindrance for investigating their true relation. Applying episode splitting to manage dynamic data analysis can easily resolve this problem.

### 3.2.2 Structural Covariate

#### *Sector and Organization*

As reviewed in Chapter Two, career trajectories may diverge across different sectors of the labor force. Because the division between public and private sectors is quite significant in Taiwan (Hou 1993; Hsin 1988; Hwang 2001a, b; Liu and Liu 1988; Tan 1998), I use this distinction as the main segmentation variable in this research. Jobs in the public sector—including state-owned enterprises—are generally regarded as good jobs in

[35] See Blossfeld and Rohwer (2002:131-175) for detailed rationales for paralleling processes, episode splitting skills, and their applications in detail.

Taiwan, because the wages, pensions, and fringe benefits of these jobs are well-regulated by the government. Job ladders in bureaucracies are institutionalized and upheld by regulations. The guarantee for long-term employment in the public sector provides relatively stable careers, which greatly appeals to Taiwanese people. These characteristics construct an internal labor market that protects employees from fluctuations in the labor market.

In the private sector, however, there are plenty of small-and-medium enterprises (SMEs) and a small proportion of large corporations, leading to less homogeneity than in the public sector. To illustrate, in 1996, 87.94 percent of the private-sector labor force worked in firms with fewer than 100 employees, versus 12.06 percent in large enterprises, and these figures[36] were not much different (84.55% vs. 15.45%) in 2008 (DGBAS online database of Manpower Survey).[37] Hence, within the private sector, I further specify two segments based on firm size. Establishments with 100 or more employees are defined as large firms in this research; otherwise they are defined as SMEs. Given the figure just mentioned, it should be noted that the definition of large firms in this research is quite restrictive and conservative for Taiwan's case.

As Baron and Bielby (1980, 1984) criticize, economic dualism constructs an ideal type that marks only the firms located at both extreme edges of the scale and fails to capture those in between. Therefore, if one interested in how structural segments of the labor market lead to different trajectories of mobility for employees within them, one needs to move to the organizational level. Working in large firms is different from the

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[36] With regard to the total labor force, these figure become 77.98 percent and 22.02 percent working in firms fewer than and at least 100 employees, respectively, in 1996, and 75.96 percent and 24.04 percent in 2008 (DGBAS online database).

[37] The DGBAS online database of Manpower Survey Statistics is available at http://www.stat.gov.tw/ct.asp?xItem=18844&ctNode=4944 (in Chinese) or at http://eng.stat.gov.tw/ct.asp?xItem=15761&ctNode=1609 (in English). The Manpower Survey is a monthly, national one conducted by DGBAS to understand the manpower supply, the status of the labor force, and employment.

employment in SMEs on many aspects such as working conditions, levels of rewards, institutional arrangements of job ladders and more. Given that there is an extreme disproportion in the numbers of SMEs and large firms in the private sector of Taiwan, the distinct effects of large firms might be ignored when comparing job mobility between public and private sectors. By specifying three types of establishments (i.e. public sector, large firms, and SMEs), my strategy is first to examine the shapes of job mobility rates changing over time to determine whether the level of job transition rates in large firms is parallel to that in the public or in SMEs. If the former is supported by the data (i.e., the private sector is heterogeneous in terms of employment and job change), joining large firms and public sector together, I define them as quasi-internal labor markets (QILM) in contrast to the competitive, external labor market composed of SMEs in the private sector. I then further analyze the influence of attaining QILM and SMEs on the time-dependence of career mobility. Conversely, if the latter is the case, then the comparison will focus on the division between public and private sectors.

Moreover, five covariates of organization concerning the means of recruitment and job ladders within firms, which may affect people's decisions regarding job mobility, are included in the analyses to complement the data of intra-firm job history and to capture variations among organization within each segment. In brief, how the effects of segmentation blend with organizational influences and jointly affect the timing, pace, and patterns of job mobility is the main theme in this part of my research. The organizational covariates investigated in the research are:

*Promotion Experience:* whether one has been promoted within a job spell, coded 1 for yes, and 0 for no.[38]

[38] I compare the answers of two questions in the questionnaire, "When you started this work, were you in a managerial position?" and "By the time you left the job, were you in a managerial position?" to identify

*Promotion Opportunity*: respondents' report about the possibility of promotion for the rank of job positions they occupy, coded 1 for very possible and possible, 0 for negative answers.[39]

*Importance of Seniority*: respondents' self-evaluation about how important seniority is to attaining the job position, coded 1 for very important and important, and 0 for negative answers.[40]

*Recruitment*: the type of recruitment of the firms for which respondents work, coded 1 for internal promotion, and 0 for otherwise.[41]

*Job Security*: the certainty that the respondent feels about the possibility for lifetime employment in the job, coded 1 for positive answers, and 0 otherwise.[42]

In addition, for the problem that the extent of segmentation and organization in the labor market may change over time at the macro level, since these characteristics including the public/private division, firm size, and organizational settings are job-specific (i.e., they change once respondents switch to another job), the construction of segmentation is also simultaneous, pertaining to each position one holds throughout his/her work life.

***Labor Market Conditions and Simulation of Economic Development in Taiwan***

This study investigates the job histories of people from a wide range of cohorts from 1936 to 1971 (ages 25 to 60 in 1996). For that reason, and because there has been very rapid economic development in Taiwan since the second half of the twentieth century, I must also take into account long-term structural changes (e.g. industrialization)

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whether or not respondents had been promoted during this job spell. These questions have four possible answers: not in a managerial position, lower-level manager, mid-level manager, and top-level manager.

[39] The question is, "By the time you left/leave this job, did/would people of a similar rank to yours have a possibility of promotion?"

[40] The question is "Did the length of employment matter in attaining your current rank/the one you had when terminating your job?"

[41] The question is "By the time you left/leave this job, how did/would your company hire people with a similar rank to yours?"

[42] The question is "If you want, is/was lifetime employment possible in your workplace?"

and short-term fluctuations in the labor market. I apply nine time series of important indicators of industrialization and economic cycle for 44 years (from 1953 to 1996) to capture structural dynamics of the labor force.[43] Because the government of the Republic of China moved to Taiwan from the Chinese mainland in 1949, it is appropriate to only use the national statistics since that time. The statistics of some indicators were not collected until 1953, however. Given that the oldest cohort in the data was born in 1936 and became 17 years old in 1953, incorporating these time-varying structural covariates results in a loss of 87 first-job episodes (i.e., 3.07% of the total sample) held before 1953. Following Blossfeld's (1986) approach, a principal components factor analysis is conducted to extract two factors, *industrialization* and *economic cycle*, from the statistics of nine indicators of structure. These two factors are different in nature. Although industrialization may display monotonic progress over the long run, the economic cycle portrays labor-market conditions fluctuating up and down transiently. Hence, an equimax rotation is conducted to make the two factors orthogonal and independent.

Table 3.2 presents the annual indicators of structural change and the results of the factor analysis. Factor I is a main factor highly correlated with per-capita gross national product (GNP); per-capita private final consumption expenditure; gross fixed capital by government expenditure; proportion of students in university, college, and graduate school at school year; and proportion of agricultural, forestry, fishery husbandry labor in the economically active population. These time series can indicate the degree of modernization and industrialization in Taiwan. Factor II accounts for 27.09 percent of the variance and is associated with the growth rate of gross domestic product (GDP), growth rate of export, growth rate of private consumption, and growth rate of unemployment.

[43] All nine time series are based on the 2001 dollar price.

These statistics reflect periodic economic conditions. Factors I and II jointly explain 93.35 percent of the variance of the nine time series from 1953 to 1996.

Table 3.2 Result of the Factor Analysis

| Annual Indicators of Structure (from 1953 to 1996) | Final factor loadings (equimax rotated) | | Initial factor loadings (principal factoring) | |
|---|---|---|---|---|
| | Factor I | Factor II | Factor I | Factor II |
| 1. Growth rate of gross domestic product (GDP) | -0.1397 | 0.9199* | -0.3806 | 0.8491 |
| 2. Gross national product (GNP) per capita | 0.9911* | -0.0860 | 0.9780 | 0.1822 |
| 3. Private final consumption expenditure per capita | 0.9884* | -0.1027 | 0.9799 | 0.1653 |
| 4. Gross fixed capital by government expenditure | 0.9383* | -0.1490 | 0.9440 | 0.1074 |
| 5. Growth rate of export | -0.1948 | 0.5674 | -0.3394 | 0.4947 |
| 6. Proportion of students in university, college, and graduate school at school year | 0.9808* | -0.0623 | 0.9617 | 0.2023 |
| 7. Proportion of agricultural, forestry, fishery and husbandry labor in economically active population | -0.9256* | 0.0332 | -0.9007 | -0.2155 |
| 8. Growth rate of private consumption | 0.0140 | 0.7626* | -0.1904 | 0.7386 |
| 9. Growth rate of unemployment [a] | 0.1624 | -0.6625* | 0.3336 | -0.5949 |
| Eigenvalue [b] | 4.9515 | 2.0245 | | |
| Proportion of total variance accounted for by factor | 66.26 | 27.09 | | |
| Cumulative proportion of explained variance | 66.26 | 93.35 | | |

Note: The symbol "*" marks the factor to which the indicator belongs.

a. Taiwan's unemployment rate stays at quite a low level. It was 4.52% in 1951 and then gradually declined to under 3% from 1967 to 1996. Hence, I use the growth rate of unemployment rates as an indicator of employment conditions in the labor force.

b. Eigenvalue is the variance accounted for by these two factors.

For investigating how well these factors illustrate structural changes in Taiwan, Figures 3.1 and 3.2 depict factor scores by year. The trajectory of factor I (industrialization) in Figure 3.1 displays an upward trend with minor ripples, which fits with Taiwan's historic development. While an obvious downturn during the 1974-1975

period reflects global economics resulting from the 1973 oil crisis, Taiwan demonstrates a straight progress as a whole. In Figure 3.2, factor II (economic cycle) shows cyclical conditions with two recessions, in 1974 and 1982. Comparing with the Leading Indicator of the Taiwan Business Cycle,[44] fluctuations on the two curves are overall approximate, except that my factor extends the time frame forward to 1953 and the amplitude of factor II is smaller than that of the leading index.[45] Briefly, the two factors constructed by nine time series of national statistics successfully simulate the reality of structural changes in Taiwan from 1953 to 1996.

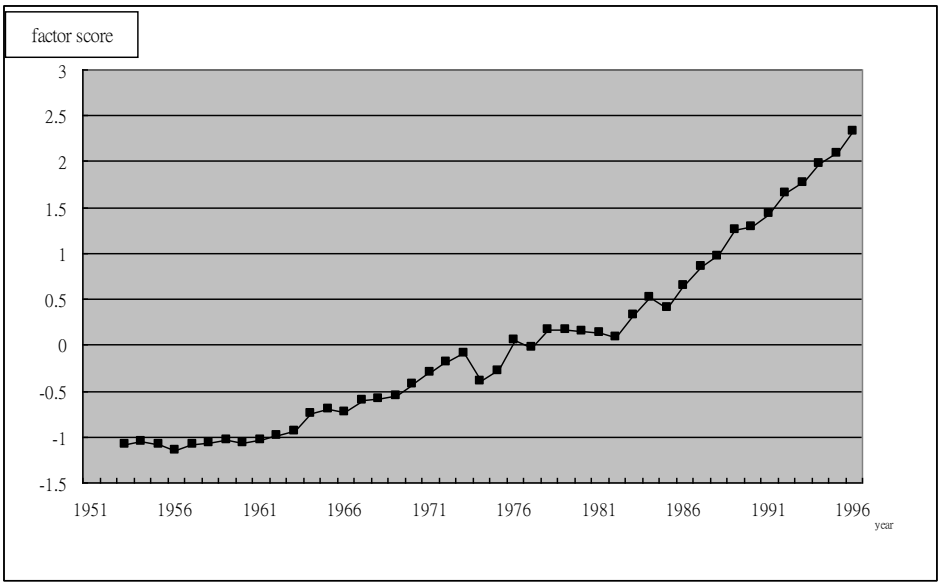


Figure 3.1 Trajectory of Factor I (Industrialization)

[44] The leading indicator of the business cycle in Taiwan has been constructed monthly by the Council for Economic Planning and Development, Executive Yuan of Taiwan since 1962. Following the methodology of compiling a composite index by National Bureau of Economic Research and Bureau of Economic Analysis in the United States, the construction of the leading index in Taiwan incorporates seven components of information: manufacturing's new orders, export by custom, monetary aggregate, average monthly working hours in manufacturing, floor area permitted for building construction, stock price index, and wholesale price index.

[45] Since both the leading index and factor II are relative indicators, Figure 3.2 presents the factor score compared with the value of the leading index divided by 5 for the purpose of comparison.

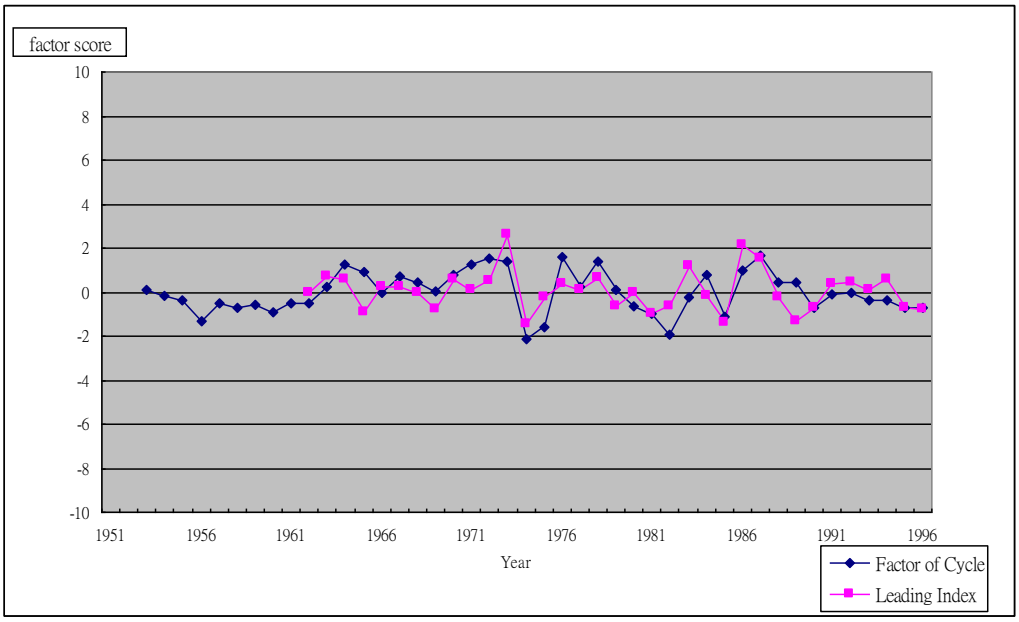


Figure 3.2 Trajectory of Factor II (economic cycle) Compared with the Leading Index of Business Cycle

Using the technique of episode splitting, my models include these two factors at two time points: time of first entry into the labor market and preceding year of job or class change. This implies four time-varying covariates of structure: the cohort effect of labor market—industrialization (CE1) and economic cycle (CE2) at the time of first entry into the labor market, and the period effect of labor market—industrialization (PE1) and economic cycle (PE2) at the preceding year of job change. I expect that people who enter into the labor market at the same time are impacted by the same labor market conditions, and this cohort effect may last and affect subsequent career mobility. In addition, the simultaneous conditions of the labor market also influence people's decisions and opportunities of job mobility, but these period effects are expected to be weaker than the cohort effects of labor market conditions. Through containing these covariates, I can control for the market dynamic's influence on career mobility.

### 3.2.3 Class Measurement

To distinguish the direction of job change, I use two measures of class in this research: the new Taiwan occupational prestige scale[46] constructed by Hwang (2003) using data from the Survey of Social Change in 1997 and the class scheme modified from Wright et al. (1982) to fit status divisions in Taiwan society. The former is an interval measure of prestige status regressed on income, skill requirements,[47] and the ethical image of an occupation in Taiwan. As mentioned in Chapter One, status attainment is highly correlated with the educational requirements of occupations in Taiwan. Professors and teachers enjoy the highest prestige, followed by doctors, lawyers, and legal professionals. In addition, protective service workers, such as policemen, are relatively respected compared to other service workers, and the prestige of art and performance associate professionals, such as singers and actors, is lower than most clerk positions in Taiwan. The detailed categories of occupations and their corresponding prestige scores are listed in Table 3.3.

[46] This research also applies international standard classification of occupation 1988 (ISCO88) of the International Labor Office (ILO, 1990) including Treiman's Standard International Occupational Prestige Scale (SIOPS) and Ganzeboom et al.'s International Socio-Economic Index of Occupational Status (ISEI) (Ganzeboom and Treiman, 1996) to analyze job mobility with directions in Chapter 5. I got approximately the same results as those using the new Taiwan occupational prestige scale constructed by Hwang (2003).

[47] Skill requirement is operationalized by two components: educational requirement and adequate job experience Hwang (2003).

Table 3.3 New Occupational Prestige Scale in Taiwan

| Occupational Category | Prestige |
|---|---|
| I. Legislators, senior officials, managers, and proprietors | |
| Legislators, senior officials, and principals | 83.8 |
| Directors, chief executives, and corporate managers | 80.8 |
| II. Professionals | |
| Professors, college teachers, and scholars | 89.8 |
| Physicians, doctors, lawyers, and other legal professionals | 87.3 |
| Accountants, business, and financial professionals | 85.1 |
| Teachers of pre-primary, primary, and secondary education | 82.6 |
| Engineers | 82.0 |
| Medical professionals: pharmacists, nurses, and midwives | 78.4 |
| Art, literature, religious, and performance professionals | 77.7 |
| III. Technicians and associate professionals | |
| Legal and law associate professionals | 82.1 |
| Teaching and research associate professionals including further education and continuation school | 80.6 |
| Government, customs, and policy inspectors | 80.2 |
| Accounting associate professionals | 79.1 |
| Engineering, aerostatic, and nautical associate professionals | 78.9 |
| Medical, agricultural, biological, and athletic associate professionals | 78.1 |
| Business associate professionals | 76.0 |
| Social work (including religious) associate professionals | 75.0 |
| Art and performance associate professionals | 74.7 |
| IV. Clerks | |
| Office clerks | 76.6 |
| Accounting clerks | 75.6 |
| Cashier clerks | 75.1 |
| Customer service clerks | 70.0 |

Table 3.3 New Occupational Prestige Scale in Taiwan (continued)

| Occupational Category | Prestige |
|---|---|
| V. Service workers and shop and market sales workers | |
| | 79.0 |
| Personal care and related workers | 76.0 |
| Shop salespersons and demonstrators | 73.1 |
| Cooks | 72.4 |
| Stall and market salespersons | 67.7 |
| Housekeeping and restaurant services workers | 66.6 |
| VI. Agricultural, forestry, fishery, and husbandry sector | |
| Agricultural, forestry, and husbandry workers | 68.6 |
| Fishermen | 64.7 |
| VII. Craft and related trade workers | |
| Metal, machinery and related trade workers | 74.7 |
| Extraction and building trade workers | 72.7 |
| Other craft and related trade workers | 71.6 |
| VIII. Plant and machine operators and assemblers | 70.6 |
| Machine operators and related operators | 70.3 |
| Assemblers | 70.0 |
| Drivers, stationary plant, and mobile plant operators | |
| IX. Unskilled | |
| Messengers, porters, doorkeepers, and related workers | 69.9 |
| Laborers in mining, construction, manufacturing, and transport | 67.1 |
| Domestic and related helpers, cleaners, and launderers | 66.2 |
| Helpers and cleaners in offices, hotels, and other establishments | 65.1 |
| Agricultural and related laborers | 64.1 |
| Street vendors and related workers | 63.6 |
| | |
| Range =26.2, Average =74.85, Standard deviation =6.59, Min =63.6, Max =89.8 | |

Source: Rearranging, translating, and calculating Table 1 in Hwang (2003:14-15)

I set ±3 points of prestige score as a cutoff to define what counts as upward (increasing more than 3 points), downward (dropping more than 3 points) and lateral shifts. Most previous research uses percentages of change as the standard to define the direction of job moves (e.g., Carroll and Mayer 1986; Dwyer 2004). Mayer and Carroll (1987), for example, define upward mobility as a job change leading to an increase in prestige scores of 20% or more, downward mobility as a decrease of occupational prestige, and lateral mobility as no change or an increase in prestige score of up to 20%. Using percentages as a cutoff is suitable for class mobility defined by earning changes; however, when applied to class moves measured by the scores of prestige or socioeconomic status, it may underestimate class mobility for people at the high status, because they need much more change in prestige scores to make an upward shift. Moreover, they usually confront a ceiling effect of class mobility because of the lower number of higher positions available for them to attain. To avoid that problem, I use the absolute value of score change. A three-point change, about a half of a standard deviation, in the new Taiwan occupational prestige scale is appropriate to show an obvious difference in the level of occupational deference. By this definition, for example, the move from a driver (prestige score =70) to a cook (prestige score =72.4) does not make an upward shift, but the move to a shop salesperson or demonstrator (prestige score =73.1) does. I assume that people attain their status by job changes, and each move brings a little range of upward mobility. Since not every job change is involved class mobility (Mayer and Carroll 1987), quantitative measurement of occupational status helps detect a small range of change in status by job mobility.

Table 3.4 Class Scheme in this research

| Class | Description |
|---|---|
| I. Owners | Proprietors, with two employees or more |
| II. Self-employed | Proprietors with zero or one employees, excluding farmers |
| III. Professionals | High grade of professionals, salaried |
| IV. Technicians and Associate Professionals | Low and middle grades of professionals, salaried |
| V. Managers and supervisors | Mid-level and top-level of Managers and supervisors, salaried |
| VI. White-collar workers | Routine non-manual employees, sales, rank-and-file employees in services |
| VII. Blue-collar workers | All manual wage-workers including non-skilled workers |
| VIII. Farmers | Agricultural, forestry, fishery, and husbandry workers, including self-employed workers |

The class scheme is the qualitative division of stratification, consisting of nominal categories based mainly on relations of production in Marxist theory. Compared to Goldthorpe's class system (1987), the advantage of Wright et al.'s scheme (1982) is that it detects the contradictory locations of petty bourgeoisie, managers, and professionals, and differentiates them from the traditional categories of stratification.[48] This scheme joins white- and blue-collar employees as workers, however, who may have significantly different working situations and life chances in the labor market. To adapt the scheme to the Taiwanese case, I first combine capitalists and petty bourgeoisie as owners, because there are relatively more small- and medium-size businesses in Taiwan. Second, I separate white- and blue-collar workers within the proletarian class, because there are qualitative differences between these two types of workers in terms of education and skill

[48] Petty bourgeoisies (i.e. small employers) own the tools of productions as bourgeoisies do, but get involved in simple commodity production, which is a contradictory location between modes of production. Managers and professionals are employees, but they have authority and semi-autonomy, respectively, which are contradictory locations within a mode of production. See Wright et al. (1982) for details.

requirements, as well as working conditions. Through separating white- and blue-collar workers, I can also test Wright's class scheme of whether they belong to the same class category. Table 3.4 presents the class categories and their definitions applied in this research. On the basis of the class scheme, an upward move among the categories may involve four distinct mechanisms: change in employment status and relations of production (e.g., from employees to employers), change in levels of authority (e.g., from fundamental workers to managers or supervisors), change between levels of autonomy (e.g., from white-collar workers to associate professionals), and change in work content (e.g. from blue-collar to white-collar jobs).

## 3.3 HYPOTHESES

### 3.3.1 Time Dependence of Career Mobility

Previous research finds that job mobility declines over time (e.g., Granovetter 1986; March and March 1981; Sorensen and Tuma 1981). For class mobility, research also indicates that younger people tend to break through the constraints of class structure and to have more class changes than older people (Konig and Muller 1986). As discussed in Section 2.3.1, the negative time dependence of job change may result from both the nature of job duration and age dependency. The former refers to the process of elimination by which people who are mismatched quit, leaving a pool of those who are better matched. The latter, in my view, might be a result combining the effects of life course, career stages, and even birth cohorts, and this needs to be further clarified. Time dependence of career development is largely ignored in the existing research about job mobility. Researchers interested in intra-generational mobility need to take time dependence into consideration and control for the effects of career stages on status attainment.

Taking career stages into account, I expect that the factors investigated in this research will display different effects for different career periods. Some background characteristics, such as educational achievement, defined by schooling, are more important in the early stages than later in careers. Conversely, time-varying attributes, such as further education and labor-force experience, are more significant to job transitions in mid-late careers.

***Hypothesis Ia. Time Dependence of Job Change: Job mobility is time dependent. Transition rates of job change are higher in early careers, and become lower and gradual for jobs that start in the mid-late stage of careers. Patterns and mechanisms of mobility differ among career stages as well.***

Different from job change, class mobility usually implies significant change in the possession of production tools, human capital, authority, or work autonomy. Changes in these elements are somehow related to stages of career development. Employees, for example, may tend to enter the class of employers during their mid-late careers, because the accumulation of capital and social networks for running businesses takes time, and the prerequisites of some managerial positions may need certain labor force experience or occupational certificates as well.

***Hypothesis Ib. Time Dependence of Class Mobility: Class mobility is time dependent in terms of career stages. Moves to certain classes, such as employers or self-employment, tend to happen in mid-late career.***

The typical scenario of career mobility predicts that people change jobs often during the early career and then settle into relatively stable employment in the later stage. In spite of frequent job changes in the late stage, people may try jobs with the same level of status. Upon attaining long-term employment, people do not pay as much attention to job searching as they did early in their careers. They tend to hold jobs until there are

much better alternatives in the labor market, or significant changes in their own conditions or changes in labor market conditions. Therefore, people in this career stage may control the direction of class mobility to a degree, corresponding to the idea derived from vacancy theory. For the relation between job change and class moves, my hypotheses are:

> ***Hypothesis IIa. Class Consistency: Compared to job mobility, class attainment is more stable and consistent throughout the lifetime.***
>
> ***Hypothesis IIb. Relationship between Job and Class Mobility: Compared to that in the early career, job mobility in the mid-late career is more likely to involve class change, even if job changes are much less frequent in this phase.***

***First Job and Class***

Since job mobility declines over time, the first job is expected to be held for a shorter time than other jobs in an individual's lifetime. Some research, however, finds converse cases because of different systems of employment in various countries (e.g., the apprenticeships in Germany) (Mayer and Carroll 1990). For Taiwan's case, I do not expect a "holding effect" of first job because many SMEs and family enterprises in Taiwan foster job shopping between employers at the beginning of careers. But initial attainment in the public sector or large enterprises may lead to long-term employment in the first job. For the first class, initial attainment has been treated as a combination of inheritance from parents' (usually father's) status and one's initial achievement, usually based on his/her education. I expect that first class lasts longer, even though first job may change soon in the beginning of careers and first class constrains the number and means of subsequent job change and class change. For example, people with first class in I (owner) and II (self-employed) may change jobs less often than those in other classes. The hypotheses about career departure are:

***Hypothesis IIIa. First Job: Taiwanese people tend to hold shorter-duration first jobs compared to durations of subsequent jobs in their careers, unless they initially work in the public sector or in large enterprises.***

***Hypothesis IIIb. First Class: People tend to remain in their first class longer than subsequent statuses in their careers. First class also constrains job shifts and its effect depends on the first class from which one departs.***

### 3.3.2 Mechanism of Career Mobility

#### *Human Capital*

As discussed in Section 2.2.1, an individual's educational achievement includes schooling and further education after entering the labor market. Schooling is a key factor of initial attainment and is expected to display its effect mainly on job mobility at the beginning of careers. But upon entering the labor market, the schooling effect makes way for other covariates of human capital, such as labor force experience and further education.

***Hypothesis IVa. Schooling and College Degree: Schooling displays a stronger, positive effect on job mobility in the early career than it does in the mid-late stage. People with college degrees have more potential for job shifts and upward mobility compared to their counterparts without such degrees, especially in mid-late careers.***

***Hypothesis IVb. Further Education: Further education fosters job transitions and upward mobility because it enhances individuals' human capital. Its effect tends to occur in mid-late careers.***

***Hypothesis IVc. Labor Force Experience: Accumulated over time, labor force experience tends to display significant effects on job mobility during the mid-***

***late career. People with more labor force experience within firms have a lower possibility of job change because their experience is firm-specific.***

***Labor Market Conditions***

People change jobs in the context of labor markets. Two dynamic covariates, industrialization and economic cycle, mark the historical locations of an individual's career departure (cohort effect) and each job spell in the career (period effect). The process of industrialization involves the transformation from agricultural to manufacturing to service industries, through which more differentiated and specialized occupations are created. Economic fluctuation in the labor market also seriously affects individuals' employment security (involuntary job change) and decisions of (voluntary) job change. With regard to the performance of these effects in different career stages, labor market conditions are expected to influence job transitions in early careers more than those in later careers. Therefore, my hypotheses about labor market conditions are as follows.

***Hypothesis IVd. Industrialization and Economic Cycle: Industrialization has positive effects on job change and upward mobility due to more occupations differentiated with the increasing level of industrialization. Because both prosperous and stagnant conditions in the labor market can induce job mobility, the economic cycle's effect on job transitions may be offset and become insignificant, but the economic cycle might have a positive effect on upward mobility.***

***Hypothesis IVe. Time Dependence of the Labor-Market Effect: Labor-market conditions display stronger effects on early-career mobility than on later-career job shifts.***

### *Life Events*

Three significant life events are investigated to identify the interaction between the life course and career development: getting married, entering into parenthood, and engaging in compulsory military service (CMS). Getting married and having children are important life events that may strongly influence people's decisions to change jobs. For females, these events tend to cause job moves from standard to nonstandard employment (Yu 2001b, 2002, 2004) or exits from the labor force (e.g., Chang 2006; Sorensen 1983b). Many argue that married men experience greater career stability over the life course than single men. However, getting married may also motivate males to improve their economic conditions by changing jobs. Thus, the impact of marriage on job mobility could be the result of a mixture of positive and negative effects for men. Moreover, it should be noted that individuals who are prone to marriage may be more prone to success in the labor market. Therefore, part of the observed effect may be caused by selectivity on unobserved variables that simultaneously affect marriage and job change. Since their significant effects on career development are strongly expected, I incorporate them in all models. Investigating how life events interact with job mobility and class mobility in different phases of career is an important objective in this project.

> ***Hypothesis IVf. Effect of Entry into Marriage and Parenthood: Entry into both marriage and parenthood has negative effects on job mobility. Their impacts on career mobility in the early career are stronger than those in the mid-late career. Females tend to experience stronger impacts than males.***

In Taiwan, almost all adult men (over 18 years old) are required to engage in CMS unless they apply for suspended conscription for the reason of further schooling.[49]

[49] A small proportion (about 10 percent) of men who fail to pass the physical examination of enrollment do not need to fulfill CMS.

The CMS conscription system leads to two main career paths: continuous careers and interrupted careers, which may induce different patterns of career development for men. Highly educated people (usually with college degrees) engage CMS before beginning their careers. But for men who leave school before the age of eighteen, CMS interrupts their careers, cutting down the time of job searching in the early stage and making them re-enter the labor market after being discharged. Researchers have not given much attention to the effects of career interruption by CMS, and thus there are two alternative hypotheses. It is thought that work before CMS is just a stopgap, and people start their careers formally after CMS. Alternatively, work experience before CMS helps careers, and people skip the tryout period after re-entering the labor market.

***Hypothesis IVh. Careers after Being Interrupted by CMS: Men who start their careers before taking CMS tend to engage in job searching again after re-entering the labor market from the military.***

***Alternative Hypothesis IVh.: Work experience before engaging in CMS helps career development after CMS. People enter into stable employment directly after CMS.***

### 3.3.3 Organization and Segmentation

In addition to influences derived from individual attributes and evolution of the life course, patterns of career mobility are also shaded by the structure of the labor market. Two aspects characterize Taiwan's labor market. First, SMEs are the prevailing form of economic organization, and second, attainment is significantly different in public and private sectors, as previous research indicates (e.g. Hou 1992; Hwang 2001a, b; Tan 1998). Since SMEs account for an overwhelming proportion in the private sector, I suspect that existing findings about the private sector in contrast to the public sector in Taiwan are dominated by the effects of SMEs, and not effects of the private sector per se.

In other words, there can be heterogeneity in terms of job mobility within the private sector. To clarify the impacts induced by the organization and segments in the labor market, the public sector, SMEs, and large firms are specified, and two sets of alternative hypotheses, Hypotheses V. and VI., are tested in the research.

***Hypothesis Va. Public vs. Private Sector: Transition rates of jobs departing from the public sector are lower than their counterparts in the private sector.***

***Hypothesis Vb. Public Sector vs. SMEs: Transition rates of jobs departing from the public sector are lower than their counterparts in SMEs of the private sector.***

***Hypothesis Vc. Public Sector vs. Large Firms: Transition rates of jobs departing from the public sector are parallel with their counterparts in large enterprises of the private sector.***

The key point in these hypotheses is whether job transitions from large firms have approximately the same rates as those in SMEs, or whether they are more parallel to job shifts in the public sector. If the data provide sufficient evidence to reject the former in favor of the latter (i.e., supporting the existence of heterogeneity in the private sector), joining large firms and the public sector together I define them as a quasi-internal labor market (QILM) in contrast to the competitive, external labor market composed of SMEs in the private sector. Because employment in the public sector/QILM is relatively secure and desirable, I expect that the frequency of inter-sector mobility is much less than job shifts within this segment, and that people who start their careers in the public sector/QILM tend to stay in it unless they have different career orientations (e.g., fulfilling the dream of having one's own business) or have to respond to specific needs of events in the life course. Hence, I further investigate the time-dependence of career

mobility within and between these sectors of the labor market by testing the corresponding hypotheses and also expect a gender difference in the analysis results.

***Hypothesis Va_1. Inter-Sector Mobility from Public to Private Sector: For people initially working in the public sector, transitions to the private sector are much less frequent than those within the public sector. If such transitions exist, they tend to happen in later careers.***

***Hypothesis Vb_1. Inter-Sector Mobility from QILM to SME: People initially working in the QILM have far fewer transitions to SMEs than those within the QILM. If they occur, they tend to happen in later careers.***

With respect to organizational settings of employment in firms, establishments with more institutionalized job ladders favoring seniority and firm-specific labor-force experience encourage employees to stay and wait for internal mobility, and, in contrast, those working in firms that usually recruit employees from outside tend to have higher rates of job transitions. When job mobility in segmented labor markets is concerned, however, some organizational covariates related to employment within firms may have alternative effects. For instance, do people who have been promoted within firms tend to stay, or to leave for better jobs in other corporations? While the answer is directly related to cost-benefit comparisons from the aspect of personal choices, when considering structural constraints in the labor market, the answer, to a large degree, depends on to what extent, only within the firms or throughout the sectors, their high productivity signaled by internal promotion would be appreciated. Because most establishments in the public sector and large firms are widely known in Taiwan's society, I expect that other employers are more likely to recognize individuals' job histories and promotion records within firms in the public sector/QILM than those in the private sector/SMEs. Therefore, employees with high capacity confirmed by the appraisal system within firms can choose

not only internal promotion but also external positions in other companies. In other words, inter-firm mobility could be a means of upward mobility commensurate with climbing job ladders within firms for people working in the public sector/QILM.

***Hypothesis Vc. Promotion Experience and Opportunity: In the private sector/SMEs, people who have been promoted or expect to have promotion opportunities tend to hold their jobs within firms. But in the public sector/QILM, the experience or opportunities of promotion do not necessarily motivate employees to stay in their jobs.***

***Hypothesis Vd. Importance of Seniority: People occupying jobs that require more seniority tend to have lower rates of job change than those holding jobs that place less importance on seniority.***

***Hypothesis Ve. Recruitment: People working in the positions that recruit employees mostly from outside tend to have higher transition rates than those that recruit mostly from inside.***

***Hypothesis Vf. Job Security: People who feel they have a high degree of long-term employment in their jobs tend to have lower transition rates than those working in positions without job security.***

### 3.4 STATISTICAL MODEL

My empirical analyses mainly apply techniques of event history data analyses to examine the time dependence of career mobility.[50] I first introduce the definition of career stages used, and the dependent variable, transition rates of career mobility, investigated in the research. By graphing the outcomes estimated in survivor functions and piecewise constant exponential models, changes of job transition rates with time in

[50] The statistical programs used in the research are STATA and transition data analyses (TDA). TDA is constructed by Goetz Rohwer and Ulrich Poetter and is available at http://www.stat.ruhr-uni-bochum.de/tda.html. Also cf. Blossfeld and Rohwer (2002) for examples, applications, and more.

the labor market can be visually illustrated to determine a cutting time point in careers to better distinguish job mobility in early careers from that in later career stages. Then exponential rate models and Cox models are employed to analyze job shifts and class mobility, respectively, in the different career phases. Finally, to clarify the joint influences derived from segmentation and organization on job mobility with attention to selection bias, I use the propensity score method to examine heterogeneous treatment effects of public sector/QILM, and further employ Cox models to examine job shifts within and between segments in Taiwan's labor market.

### 3.4.1 Career Stage and Hazard Rate Model

Many clocks run on the process of intra-generational mobility. As discussed in Section 2.3, existing knowledge about the time dependence of job change is based on results compounding time dependence on job tenure, age, life courses and even birth cohorts. My goal in this research is to differentiate the nature of career development from other paralleling proceedings taking place in the life course. On the process of career development, transition rates of job change are expected to be high in the beginning of careers and then to decline to a low, flat level throughout careers. This dependence of career development is not equivalent to the negative dependence of job tenure found in previous research, which indicates that the possibility of job change declines by duration of job holding. Career development proceeds with the time one stays in the labor market.

#### *Defining Career Stage*

Careers start at the time of first entry into the labor force, even though there is no consensus regarding what defines "first entry" (Oppenheimer and Kalmijn 1995).[51] The time of first entry into the labor force marks the historical location of one's career.

[51] What defines as "first job" is left to respondents' discretion in this research.

Correspondingly, the start time of a job spell marks its location in one's career. To define the early stage of careers, I consider using two time periods, the first 5 years and the first 10 years, to explore the distinction between early careers and later careers. To illustrate, supposing TS, TE, and TF refer to the starting time, ending time, and time of first entry into the labor force, respectively, then early careers are defined as jobs with TS-TF<5 or TS-TF<10, and otherwise are defined as mid-late stage careers. To decide which one can better illustrate the distinction of early mobility in careers, I do a graphical check based on the results of survivor functions and compare the trajectories of estimated transition rates in piecewise constant exponential models for jobs starting within first 5 years, 5 to 10 years, and after 10 years, respectively. The following are their statistical formulas and elucidation.

***Dependent Variable: Transition Rates***

The dependent variable mainly investigated in this research is transition rates[52] of career mobility (including job, class and sector mobility, respectively). Supposing jobs initially undertaken at time $t_0 = 0$ and two possible states: staying and leaving, in the risk set of job holding. Borrowing Blossfeld and Rohwer's (2002:31-37) notation, a random variable T represents the duration, beginning at $t_0$ until a change in job holding, i.e., a transition to the destination state (leaving in this case) and the possibility of job change is defined as

$$\Pr ( t \le T < t' | T \ge t ), \quad t < t' .$$

This is the transition probability that an event occurs in the time interval from $t$ to $t'$, given that no event has occurred before, i.e., in the interval from $t_0$ to $t$. The definition of transition probability relies only on the information of the past process of job holding,

[52] Transition rates are also called hazard rates, failure rates, intensity, risk functions or mortality rates in different disciplines.

that is, what has happened up to a certain time point $t$. And transition rates can be defined by the limit of the ratio of the transition probability to the length of the time interval:

$$\gamma(t) = \lim_{t' \to t} \frac{\Pr(t \le T < t' | T \ge t)}{t' - t}, \qquad (1)$$

representing the propensity to change the state of job holding per unit of time.

The function of transition rates depends on the probability distribution of duration variable T. Supposing the probability distribution of T is $F(t) = \Pr(T \le t)$, the density function of job duration T is

$$f(t) = \lim_{t' - t} \frac{F(t') - F(t)}{t' - t} = \lim_{t' - t} \frac{\Pr(t \le T < t')}{t' - t},$$

which is the probability of a job change per unit of time in the future. The survivor function is defined as

$$G(t) = 1\text{-}F(t) = \Pr(T > t),$$

the proportion of individuals who have not yet changed their jobs up to time $t$. Then the transition rates defined in equation (1) can be written as a joint function of density and survivor functions of T:

$$\gamma(t) = \lim_{t' \to t} \frac{\Pr(t \le T < t')}{t' - t} \frac{1}{\Pr(T \ge t)} = \frac{f(t)}{G(t)}, \qquad (2)$$

the probability per unit of time that an individual who has survived up to the time point $t$ will leave his/her job in the future.

***Survivor Function***

As Blossfeld and Rohwer (2002:56) remark, survivor functions are a nonparametric descriptive method especially suitable for first exploring transition data, because they do not assume a distribution of transition rates under study. I use the

product-limit method[53] to estimate survivor functions. Different from the traditional calculation confined within discrete time intervals in the life table, its calculation executes at each time when at least one event happens in the risk set, and therefore its derivative is product-limited. Using Blossfeld and Rohwer's (2002:72-73) notation, supposing there is a sample with $N$ episodes and $q$ time points $\tau_l$ ($l$ = 1,2,…,$q$) with $\tau_1 < \tau_2 \ldots < \tau_q$ when at least one episode ends with an event. Let $E_l$ and $R_l$ respectively refer to the number of episodes ending with events and the number of episodes left in the risk set at $\tau_l$, and the survivor function estimated by the product-limit method is

$$\hat{G}(t) = \prod_{l:\tau_l<t} (1 - \frac{E_l}{R_l}), \qquad (3)$$

which is a step function with steps at the time points $\tau_l$.

The standard error of the survivor function is

$$\mathrm{SE}(\hat{G}(t)) = \hat{G}(t) \left[ \sum_{l:\tau_l<t} \frac{E_l}{R_l(R_l - E_l)} \right]^{\frac{1}{2}}.$$

***Piecewise Constant Exponential Model***

Piecewise constant exponential models are exponential rate models with the time axis split into several intervals in which the transition rates are assumed to be constant within but can vary across. Similar to survivor functions, this model can help researchers explore the time dependence of the process, in other words, the distribution of transition rates for the events investigated. Referencing Blossfeld and Rohwer's (2002:120-121) notation, supposing we set up the time cut-points $0 = \tau_1 < \tau_2 \ldots < \tau_L$, resulting in $L$ periods on the time axis: $I_l = \{t \mid \tau_l \leq t < \tau_{l+1}\}$, $l$=1,…,$L$. The transition rate from origin state $j$ to destination state $k$ is

$$\gamma_{jk}(t) = \exp\{\bar{\alpha}_l^{(jk)}\}, \qquad \text{if } t \in I_l \qquad \text{(no covariates)} \qquad (4)$$

[53]The product-limit estimation is also called the Kaplan-Meier method (1958). For a detailed statistical interpretation and an application, see Blossfeld and Rohwer (2002:56-85).

$$\gamma_{jk}(t) = \exp\{\bar{\alpha}_l^{(jk)} + X^{(jk)}\alpha^{(jk)}\}, \text{ if } t \in I_l \quad \text{(with covariates)} \quad (5)$$

For transitions from origin state $j$ to destination state $k$, $\bar{\alpha}_l^{(jk)}$ is a constant coefficient associated with the $l$th time period. $X^{(jk)}$ is a set of covariates and $\alpha^{(jk)}$ is a vector of associated coefficients assumed to vary or not to vary across time periods. I use maximum-likelihood estimation to estimate this model. Defining $l[t]$ as the index of the time period containing $t$, i.e. $t \in I_{l[t]}$, the conditional survivor function is:

$$G(t|s) = \exp\{-\sum_{l=1}^{L} \Delta[s, t, l] \exp(\bar{\alpha}_l + X\alpha)\}$$

$$\Delta[s,t,l] = \begin{cases} t - \tau_l & \text{if } s \le \tau_l, \tau_l < t < \tau_{l+1} \\ \tau_{l+1} & \text{if } s \le \tau_l, t \ge \tau_{l+1} \\ \tau_{l+1} - s & \text{if } t > \tau_{l+1}, \tau_l < s < \tau_{l+1} \\ 0 & \text{otherwise} \end{cases}$$

The log likelihood can be written as

$\ell = \sum_{i \in \varepsilon} (\bar{\alpha}_{l[ti]} + X_i\alpha) - \sum_{i \in N} \sum_{\ell=1}^{L} \Delta[s_i, t_i, l_i] \exp(\bar{\alpha}_l + X_i\alpha)$, where $N$ is the set of all episodes.

Considering an average 1.59 jobs held within the first 5 years and 2.14 jobs in the first 10 years in relation to the average 2.78 jobs in the whole career for Taiwan people, I construct three piecewise constant models for jobs beginning within first 5 years, 5 to 10 years, and after 10 years, respectively. To display detailed shapes of rates changing by time, the time axis in the models is split into 2-year intervals (i.e., the rates are re-estimated every 2 years). Based on the results, I graph the estimated transition rates and compare their trajectories to decide which partitioning strategy best distinguishes job change in the early stage from that in later careers.

***Exponential Model***

Exponential models are applied to analyze job mobility in different career stages in this research. This model assumes that the duration of episodes follows an exponential distribution, and the transition rate is constant and allows variance with combinations of

different values of covariates. Since significant differences in the level of transition rates are expected among career stages, it is appropriate to analyze them in separate models with the assumption of constant rates in each stage. Using Blossfeld and Rohwer's notation (2002:87-91), supposing $a$ is a positive constant, $A_{jk}$ is a set of covariates, and $\alpha_{jk}$ is a vector of associated coefficients. Relevant functions of duration variable $t$ are:

Density function: $f(t) = a \exp(-at)$

Survivor function: $G(t) = \exp(-at)$

For the transitions from origin state $j$ to destination state $k$, the rate function is

$$r_{jk}(t) = \exp(A_{jk}\alpha_{jk}) = a \qquad (6)$$

Using the maximum-likelihood method to estimate this model, the log likelihood[54] can be written as

$$\ell = \sum_{i \in o} \sum_{k \in D_j} \sum_{i \in \varepsilon_{jk}} \log \{ r_{jk}(t_i) \} + \sum_{i \in N_j} \log \{ \tilde{G}_{jk}(t_i) \}$$

***Cox Model***

Cox models are applied to analyze class mobility among different career stages and job mobility within and between different sectors, because their distributions of transition rates are unknown. Cox models are semi-parametric transition rate models that do not assume specific distributions of transition rates.[55] Taking Blossfeld and Rohwer's (2002:228-231) notation, for the transitions from origin state $j$ to destination state $k$, $h_{jk}(t)$

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[54] The notation of the likelihood are: $o$ as the set of origin states, $D_j$ as the set of potential destination states for episodes with origin $j \in o$, $N_j$ as the set of all episodes, and $\varepsilon_{jk}$ as the set of all episodes having an event with origin state j and destination state k. $\tilde{G}_{jk}(t_i)$ is the pseudo-survivor function, defined by $\tilde{G}_{jk}(t_i) = \exp\left( -\int_0^t r_{jk}(\tau) d\tau \right)$. For a detailed algorithm, see Blossfeld and Rohwer (2002:87-91).

[55] Cox models have two assumptions about transition rates and the episodes ending with the events, respectively. First, the proportionality assumption is that transition rates change proportionally by different values of covariates. Second, the assumption of no ties means that all ending times of episodes with the events in the risk set are different. If too many episodes end at the same time with the events, then discrete time models are more suitable to analyze the data (Blossfeld and Rohwer 2002).

refers to the unspecified baseline of transition rates, $A^{(jk)}(t)$ is a vector of covariates, and $\alpha^{(jk)}$ is a vector of associated coefficients. The transition rates of duration $t$ in Cox models can be written as

$$\gamma_{jk}(t) = h_{jk}(t) \exp\{ A^{(jk)}(t)\, \alpha^{(jk)} \}. \qquad (7)$$

Leaving the baseline of transition rates unspecified, Cox models are mainly constructed by relevant covariates. For estimation, Cox models need to include at least one covariate, because there is no intercept contained in the models and all constant effects are incorporated in the baseline rates. To estimate Cox models, the maximum partial likelihood method is used, which can be interpreted as the probability of the $i$th individual to have an event at time $t$, given the risk set composed of all individuals who could have an event. Supposing $\varepsilon$ is the set of all episodes from origin state $j$ to destination state $k$ and $R(t_i)$ is the risk set of the $i$th episode contained in $\varepsilon$ at the ending time $t_i$, the partial likelihood is

$$L^P = \prod_{j \in \varepsilon} \frac{\exp(A_i(t_i)\alpha)}{\sum_{l \in R(t_i)} \exp(A_l(t_i)\alpha)}.$$

### 3.4.2 Heterogeneous Treatment Effect of Segmentation in the Labor Market

Inspired by the dual economy and the theory of segmented labor market, I further investigate the impacts of structural constraints on job mobility in Taiwan's labor market. Based on findings in existing research about significant differences of status attainment in Taiwan's public and private sectors, I consider using the division of public/private sectors as segmentation to explore the trajectories of job mobility departing from different segments. Meanwhile, since SMEs predominate in Taiwan's private sector, I conjecture that career mobility between SMEs and large firms is heterogeneous in the private sector and that the effects of SMEs mask the influences of large firms. To ascertain this, piecewise constant exponential models with the time axis split into two-year-intervals are first applied to examine the shapes of job shifts departing from the public sector, large

firms, and SMEs, respectively. Graphs of the model results will clearly show whether the trajectory departing from large firms tends towards that of the public sector or SMEs.

Suppose heterogeneity of job mobility in different organizational forms of the private sector is observed, and large firms may provide environments regarding employment and job transitions similar to those in the public sector. Joining jobs in both large firms and the public sector together, I name them the quasi-internal labor market (QILM) and further analyze inter-sectoral and intra-sectoral mobility among these two segments (i.e., job transitions within and between QILM and SMEs) and their interactions with time dependence in careers. Alternatively, if the trajectory of job mobility in large firms is similar to that in SMEs, meaning homogeneity in the private sector, the analyses would focus on comparisons between public and private sectors.

Considering critiques in the theory of segmented labor markets mentioned in Chapter Two, this section focuses on issues of selection bias and heterogeneity when determining the causal effects of segmentation of the labor market on job mobility via specific segments as treatments. The counterfactual models of causality are first introduced to indicate difficulties of casual inference in social-science research using observational data. Because a random assignment of subjects to treatments in social reality is impossible, two types of selection processes that may bias the validity of causal inference result respectively from heterogeneity in pre-treatment characteristics and in treatment effects. To handle these two sources of selection bias, the propensity score method is applied in this research to evenly distribute pre-existing characteristics among treated and untreated people with the same propensity of entry into the treatment state. Then a hierarchical linear model is adopted to examine whether the treatment effects induced by specific segments change systematically with different propensity strata.

***Counterfactual Considerations and Selection Bias***

Social-science research is based on observation and, to be accurate, researchers can observe only what has happened. This characteristic of the social sciences differs radically from experiments in the natural sciences, which can randomly allocate a stimulus or a treatment to subjects to isolate its causal effect from other confounding factors. In social reality, one's exposure to alternative causal states is determined not only through the particular social process that allocates him/her to different states, but also by his/her decision to enter one state or another. The preceding processes of selection confound cause-and-effect mechanisms. Using observational data to draw a causal claim therefore is a big challenge for social scientists.

Over the past three decades, researchers have developed counterfactual models of causality to differentiate potential outcomes from observed results under treatment states and to adjust findings of causal analyses in quantitative social-science research with observational data (cf. Morgan and Winship 2007). The basic framework of counterfactual considerations is that each member of the population of interest has two alternative outcomes: observable and potential (i.e., counterfactual), regardless of which group, control or treatment, he/she has been actually observed. Borrowing the conventional notation of causal inference to illustrate (Morgan and Winship 2007:34-37), suppose $D$ refers to a random variable with two values: $d_i$ =1 for individual $i$ observed in the treatment group, and $d_i$ =0 for he/she observed in the control group, and the corresponding values of the observed outcome variable $Y$ are $y_i = y_i^1$ and $y_i = y_i^0$, respectively. In other words, the observed outcome variable $Y$ is defined as $Y=Y^1$ if $D$ =1, and $Y=Y^0$ if $D$ =0. Therefore, $Y$ can also be written as

$$Y= DY^1 + (1-D)Y^0 \qquad (8)$$

The estimation of individual-level effects caused by the treatment is based on the counterfactual inference. In other words, what if outcomes would have been observed for a subject under the treatment state it did not actually receive? We can observe only the observable outcomes and lose information about the counterfactual ones, however. Therefore, social scientists cannot specify causal effects at the individual level, but the aggregated causal effects can be calculated by the difference in the expectations between treatment and control groups. With E[.] referring to the expectation function from probability theory, the average treatment effect[56] (ATE) in the population is

$$E[\delta] = E[Y^1 - Y^0] = E[Y^1] - E[Y^0] \quad (9)$$

While the treatment effect at the population level can be estimated by the average difference between treatment and control groups, heterogeneity at the individual level in terms of potential outcomes and causal effects is inherent, but overlooked in social-science research. Moreover, because social scientists are unable to randomly assign treatments to subjects, the preceding process of self-selection and the mechanisms of distributing treatments in social reality may bias estimated results of causal effects. Morgan and Winship (2007) summarize two types of selection bias in observational data. First, when pre-existing characteristics (including observed and unobserved factors) are associated with both the treatment and the outcome, it induces heterogeneity and the estimation of aforementioned average treatment effects would be biased. In our case, with initial attainment in the public sector/or QILM as a treatment, individual characteristics, such as race and social background, may be correlated with both the likelihood of entry

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[56] Two other treatment effects of interest are average treatment effects for the untreated (ATC, with C standing for "control"),

$$ATC = E[\delta \mid D=0] = E[Y^1 - Y^0 \mid D=0] = E[Y^1 \mid D=0] - E[Y^0 \mid D=0]$$

and average treatment effects for the treated (ATT)

$$ATT = E[\delta \mid D=1] = E[Y^1 - Y^0 \mid D=1] = E[Y^1 \mid D=1] - E[Y^0 \mid D=1].$$

into the segment and job transition rates. Second, the treatment effect per se could be heterogeneous. For example, differences in job transition rates between people beginning their careers in the public sector/QILM vs. the private sector/SMEs may vary systematically with education or other important covariates.

***Propensity Score Method***

To handle the problem of selection bias, I adopt the propensity score method to balance covariates preceding the treatment and to detect whether the treatment effects of segmentation on job mobility are heterogeneous (cf. Rosenbaum and Rubin 1983, 1984 for the method; see Brand and Davis 2009; Brand and Xie 2010; Xie and Wu 2005a, b for its application to heterogeneity; see Tsai and Xie 2008 for its application to Taiwan's case). This method aggregates individuals in terms of their propensities of entry into the treatment. Each member in the population of interest who is observed or not observed under the treatment state has a propensity score estimated by pre-existing attributes, and the population can also be stratified into several strata of similar propensities for analytical purposes. Incorporating predicted propensity scores into the main models of analyses and allowing them to vary or not vary with strata, one can tell whether treatment effects are homogeneous or heterogeneous through comparing the estimated results among strata.

Different from other alternative methods for handling heterogeneous treatment effects, the propensity score method enables us to estimate heterogeneous treatment effects non-parametrically under a relatively simple assumption: ignorability (cf. Brand and Xie 2010 for a review). The propensity score method assumes that after controlling for a rich set of preexisting, observed covariates that can completely characterize the mechanism of treatment assignment, there are no other confounders between people who are observed and not observed in the treatment state (Rosenbaum and Rubin 1983, 1984).

Under this assumption, in our case, the propensity score of entry into the public sector or QILM for individual *i* is estimated by a logit model:

$$P_i = \Pr(D_i = 1 | \mathrm{X}) \quad \text{and} \quad \log\left[\frac{P_i}{1-P_i}\right] = \sum_{m=0}^{M} \beta_m \mathrm{X}_m \qquad (10)$$

where X is a vector of observed covariates and $\beta$ is a vector of associated coefficients of X. The propensity score is defined as the probability of assignment to the treatment group, given the set of observed, preexisting covariates. If we aggregate individuals with the same predicted propensity scores and specify whether or not they are observed under the treatment state, among them the preexisting attributes predicting the likelihood of entry into the treatment will be approximately balanced between treated and untreated people. Hence, under the ignorability assumption, the treatment assignment *D* is independent of the outcome variable *Y*, given the same propensity scores predicted by X (i.e., $Y \coprod D|\mathrm{X}$ where the symbol $\coprod$ denotes independence). Therefore, this solves the first type of selection bias statistically.

Incorporating predicted propensity scores and estimating expected differences between treated and untreated individuals by Cox models, I then obtain the average treatment effects of specific segments, which are conventionally assumed to be homogeneous. The Cox model can be presented in logarithmic form as:

$$\log r_i(t) = \log h(t) + \beta P_i + \delta d_i + \alpha A(t) \qquad (11)$$

where $\log h(t)$ is the unspecified baseline of transition rates; $P_i$ is the propensity of individual *i* with the corresponding coefficient $\beta$; $\delta$ is the average effect of segmentation on job mobility with $d_i$ indicating whether or nor people entry into specific segments; and $A(t)$ refers to a vector of post-existing covariates with a vector of associated coefficients $\alpha$. The estimated treatment effects of specific segments in equation (11) are conditional upon the propensity score as a function of pre-existing covariates, as well as

some covariates succeeding the treatments and affecting the outcomes of transition rates.[57]

***Hierarchical Linear Model***

Even though the selection bias in pre-treatment heterogeneity could be controlled using the propensity score method, heterogeneity in treatment effects may also bias the causal inference with observational data when the treatment effects estimated under the assumption of homogeneity are actually the average heterogeneous effects unevenly weighted across individuals in the population. To examine whether the treatment effects are heterogeneous, I divide continuous propensity scores into several strata to construct a categorical scale by which there are no significant differences in the average of propensity scores, as well as the values of the corresponding pre-existing covariates between treated and treated individuals. I then estimate the average treatment effects within each stratum of propensity scores using a set of Cox models. In this case, equation (11) becomes the following:

$$\log r_i(t) = \log h(t) + \delta_s d_i + \alpha A(t) \qquad (12)$$

where $\delta_s$ is the treatment effect of segmentation for stratum $s$ of propensity scores. Pooling the estimated treatment effects among strata and analyzing them in a hierarchical linear model (HLM), we can further detect trends in the treatment effects of heterogeneity, in other words, how treatment effects vary systematically with people's likelihood of entry into treatment states. Therefore, using variance weighted least squares, the second-level function in HLM regresses the estimated treatment effects in equation (12) on the rank of propensity strata. The model can be written as

$$\delta_s = \gamma + \upsilon \mathrm{S} + \varepsilon \qquad (13)$$

[57] It is sufficient to substitute the predicted propensity scores for the vector of pre-existing covariates contained in the main models of analyses, according to Rosenbaum and Rubin's (1983, 1984) demonstration.

where $\gamma$ and $\upsilon$ are the intercept and slope for the regression linear of treatment effects, respectively. Analyzing heterogeneous treatment effects in this way is equivalent to investigating the interaction between segment attainment effects and all the differences in the pre-treatment covariates that influence both the probability of attaining specific segments and job transition rates via a single dimension (i.e., the propensity). Stated differently, among people who are observed and unobserved in a specific segment, there may be different trends, upward or downward, in the effects of this segment on job shifts by propensities.

***Summary***

In brief, this part of the research aims to examine the causal effects of segmentation in the labor market on career mobility, including job change and its time dependence. Taking selection bias into consideration, the propensity score method is applied to control for heterogeneity in pre-treatment characteristics, which may be associated with both segment attainment and job mobility, and hierarchical linear models are adopted to assess whether the effects of specific segments on job change are heterogeneous via different likelihoods of attaining the segments. Through comparing the estimated effects of segmentation under homogeneous or heterogeneous assumptions, I can adjust the casual inference between segmentation and its influence on job mobility, and further detect the pattern in the variation of effects (i.e., whether the estimated effects are positively or negatively correlated with the propensity of entry into specific segments).

# Chapter 4: Time-Dependence of Job Mobility

This chapter investigates the time dependence of job mobility throughout careers and the impacts of interruption by compulsory military service (CMS) on career mobility. Considering that career paths may change because of the timing of CMS, all analyses are done separately according to whether people have continuous or interrupted careers. The former group includes women, men who complete CMS before entering the labor force, and a few men who never take CMS. For men who engage in it, CMS interrupts and separates their careers into two sessions: a relatively short spell of employment before taking CMS and a "normal" career after re-entry into the labor market from the military. Using survivor functions and piecewise constant exponential models, I first demonstrate how career development proceeds by examining the shapes of job transition rates in early career stages, using different definitions. The goal of Section 4.1 is to choose an appropriate cutoff time-point (first 5 or first 10 years in careers) that best matches the uniqueness of frequent job changes in early careers. On the basis of this definition, Section 4.2 further analyzes differences in the mechanisms of job mobility between early and mid-late careers. Section 4.3 disentangles the puzzle of whether work experience before engaging in CMS helps people enter into relatively stable employment after re-entering the labor force.

## 4.1 CAREER STAGE

### 4.1.1 Basic Description of Job History for Taiwan People

Compared to the average length of a man's job in the United States (2.17 years) and West Germany (5.98 years),[58] a Taiwanese man has a longer job length of 6.61

[58] The U.S. estimate uses data from around 1970 (Tuma, 1985) and the German figure is calculated from data around 1982 (Carroll and Mayer 1986).

years[59] averaged over the life course, based on data in 1996. In terms of age of first entry into labor market, Table 4.1 shows that most people start their career between the ages of 15 and 19, with an average for the entire population of 18.51 years old. Because these data contain a wide range of cohorts from 1936 to 1971, we can expect an older age of entry into the labor market for people born in later cohorts than earlier ones.[60]

Table 4.1 The cumulative percentages of age at first entry into the labor market

| Age | Entire population (%) | Men (%) | Women (%) |
|---|---|---|---|
| 12-14 | 21.29 | 20.00 | 24.07 |
| 14-19 | 65.81 | 62.44 | 69.57 |
| 20-24 | 88.98 | 85.57 | 92.78 |
| 25-29 | 97.03 | 98.47 | 95.42 |
| 30-39 | 99.27 | 99.86 | 98.60 |
| 40 and older | 100.00 | 100.00 | 100.00 |
| Total | 2723 | 1435 | 1288 |

Note. Here does not include people who have never worked and those working in the military.

With respect to job change during early careers, Table 4.2 shows that individuals have an average of 1.59 jobs within first five years. No significant difference exists between genders according to *t*-tests. If someone starts to work at age 18 and retires by 65 years old, the first five years in the labor market accounts for one tenth of his/her whole career. Compared to a total of 2.92 job changes for men and 2.63 jobs for women in a lifetime, on average, one can claim that most job mobility occurs during early careers. For the first 10 years in careers, which is about one fifth of the average career, the average number of job changes is 2.14 for the total population: 2.21 jobs for men and 2.05 jobs for women. There is a significant difference in the mean number of jobs between genders, at a *p*-value lower than .0000, according to the *t*-test.

[59] All U.S., German, and Taiwanese estimates contain both censored and uncensored jobs across the life course of a random national sample of men. Using the same data, the average length of jobs for women in Taiwan is 5.60 years, one year less than that of men.

[60] The average ages of first entry into the labor market for three birth cohorts (1936-51, 1952-61, 1962-1971) in this research are 18.34, 18.17, and 19.11, respectively.

Table 4.2 Summary of number of jobs taken in first five and ten years in the labor market

| In first 5 years | total | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|---|
| Overall population | 2723 | 1.59 | .82 | 1 | 7 |
| Men | 1435 | 1.57 | .83 | 1 | 7 |
| Women | 1288 | 1.61 | .82 | 1 | 6 |
| In first 10 years | | | | | |
| Overall population | 2723 | 2.14 | 1.20 | 1 | 11 |
| Men | 1435 | 2.21 | 1.21 | 1 | 10 |
| Women | 1288 | 2.05 | 1.17 | 1 | 11 |
| In career | | | | | |
| Overall population | 2720 | 2.78 | 1.63 | 1 | 15 |
| Men | 1434 | 2.92 | 1.68 | 1 | 14 |
| Women | 1286 | 2.63 | 1.57 | 1 | 15 |

Note: This table skips people who have never entered labor market. Fifteen is the maximum on job records. The Survey of Social Change asks for respondents' job history from the first job to the 15$^{th}$ job that they have ever worked.

### 4.1.2 Job Mobility throughout Careers

Dividing careers into three career stages: jobs initially held in first 5 years, during 5th to 10th years, and after the 10th year in careers, I investigate the shapes of their survivor functions estimated by the product-limit method using every job in the lifetime as a unit. In Figure 4.1, it is clear that the survivor function for jobs held at the beginning of careers decreases much more steeply in relation to those for other jobs that started in later careers. Up to the duration of 15 years, only 10% of jobs that started within the first 5 years are left, compared to 30% and 45% of jobs that survived for those initially held during the 5th to 10th and after the 10th year of careers, respectively.

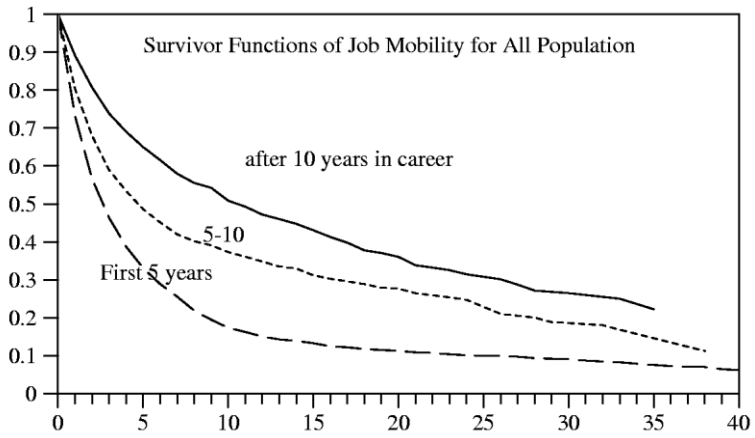


Figure 4.1 Survivor Functions for Job Mobility in Different Periods of Careers

To further examine the trajectories of job change among these groups, I construct a set of piecewise constant exponential models with the time axis split into two-year intervals in which the transition rate is fixed and constant, but can vary across intervals (Blossfeld and Rohwer 2002). The transition rates estimated in the models are unconditional rates, i.e., the piecewise constant exponential models do not contain any covariates. The statistical results show that there are significant differences in job transition rates among the intervals. Figure 4.2 demonstrates trajectories of transition rates estimated in the models by job tenure. Treating every job in these careers as a single and independent event, as conventionally assumed in research on job mobility, the model in graph (A) of Figure 4.2 shows a normal and non-monotonic process of job exit, in which the transition rate of job change increases sharply to a maximum ($r$ = 0.2050 in this sample) within a short period of time in the beginning and then decreases gradually with increasing duration toward a stable level (under $r$ = 0.04 around the duration of 15 years). Graph (A) visually presents the duration dependence of job change found in previous research.

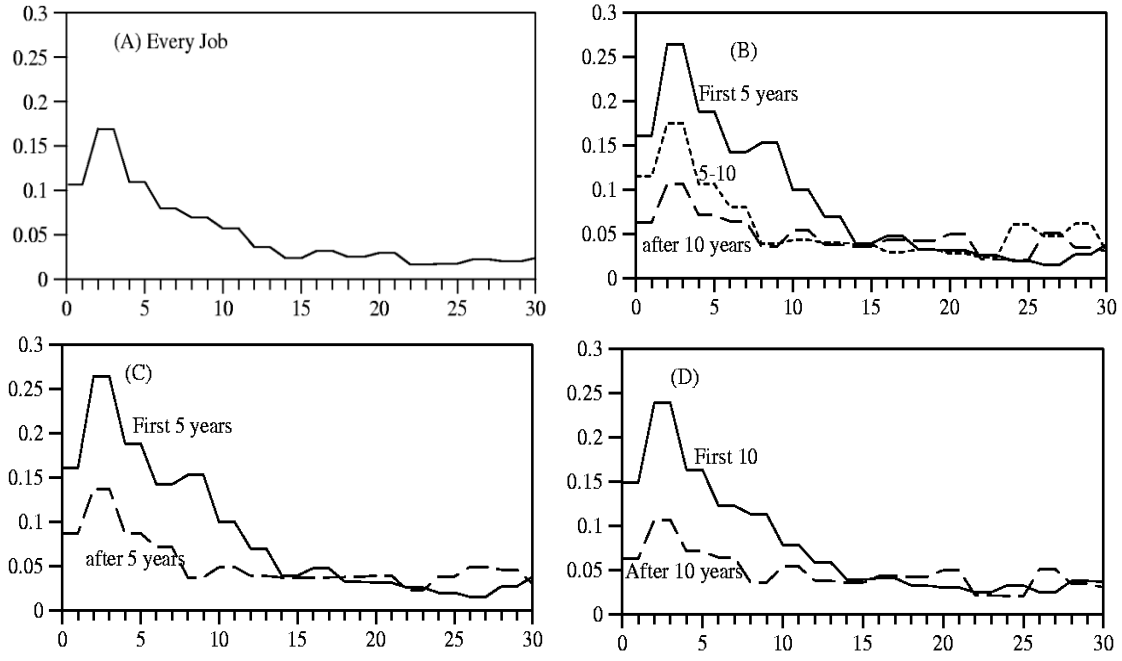


Figure 4.2 Piecewise Constant Exponential Rates (in 2-Year Interval) of Job Change for Jobs Starting in Different Phases of Careers

Models in graphs (B) to (D) separate the jobs that start in different career stages and analyze their transition rates changing with duration. Jobs initially taken in different career phases have distinct shapes of exit rates, such that "the normal process" of job exit presented in graph (A) is actually a joint outcome composed of estimated transition rates for jobs held in different career stages. In graph (B), jobs starting in first five years, in particular, have a unique trajectory where the transition rates are much higher (the maximum reaching $r = 0.2644$ ) than jobs in later careers. Comparing graphs (C) and (D), jobs in early careers (either within the first 5 or first 10 years) exit at greater rates and their fast pace even lasts until the 15-year duration. The baseline of jobs beginning in first 10 years in graph (D), on average, have lower levels of exit rates than those starting in first 5 years in graph (C), because the former include a wider span of time so that the

estimated transition rates are compromised by lower rates for jobs initially taken during the 5th to 10th years in careers.

***Career Stage vs. CMS***

Taking a closer look at graph (C), the shape of job-exit rates in early careers has double peaks. In other words, there are two periods of time with a high risk of job exit: at the beginning of holding a job and around the 8 to 10 year duration. I conjecture that this results from including the jobs taken before CMS, because these jobs have relatively short durations and all of them would be terminated upon enlistment. With this concern, I separate the men who start their careers before taking CMS from other individuals, construct two sets of piecewise constant exponential models, and graph the estimated results in Figure 4.3 for comparison. For the former, graph (F) displays dramatic differences in job change between career stages. Notice that the scale of the vertical axis in Graph (F) is different from that in other graphs. The peculiar baseline of exit rates for jobs started in first 5 years of careers reaches its maximum, $r = 0.6358$, around the duration of 8 to 10 years, and then sharply decreases to an extremely low level ($r = 0.0303$). Graph (F) explores the special time dependence of career mobility for people with careers interrupted by CMS. After subtracting this group of people from the total population, we find in graph (E) that the trajectory for jobs initially held in early careers returns back to the single-peak shape, as presented in graph (A) of Figure 4.2. Except for their different levels, the two trajectories of transition rates for early and mid-late stages have similar shapes with increasing duration of time.

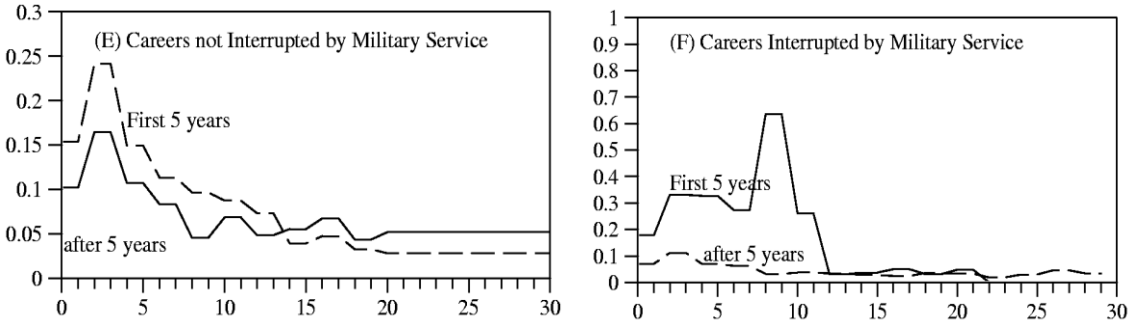


Figure 4.3 Piecewise Constant Exponential Rates (in 2-Year Interval) of Job Change Comparison of People with Careers Interrupted and Not Interrupted by CMS

Table 4.3 further summarizes the average transition rates estimated in exponential rate models among career stages. The results in Table 4.3 indicate two findings. First, using either division of career stages, jobs in early careers have much higher risks of termination than those beginning in later careers. Second, people who enter the labor force before taking CMS are a special group in terms of their time dependence of career development. They have an extremely rushed period in the beginning and enjoy quite stable employment in later careers. Their average transition rate for jobs taken after five years is 0.0590, even lower than that for the same stage of people having continuous careers.

Table 4.3 Estimated Transition Rates of Job Change in Different Phases of Careers

| Estimated transition rates | First 5 yr. | After 5 yr. | First 10 yr. | After 10 yr. | Total |
|---|---|---|---|---|---|
| People with continuous careers | .1312 (2447) | .0990 (933) | .1277 (2959) | .0861 (421) | .1204 (3380) |
| People with careers interrupted by CMS | .2514 (1134) | .0590 (744) | .1533 (1548) | .0470 (330) | .1097 (1878) |
| Total population | .1543 (3581) | .0761 (1677) | .1355 (4507) | .0630 (751) | .1163 (5258) |

Note. The number of job changes happening in the stage is in parentheses.

In brief, the graphical inspection above reveals the distinction of job mobility in early careers from that in later stages, and it also helps us detect the uniqueness of career

mobility for people who enter the labor force before taking CMS. Considering all the results presented above, I choose to use the fifth year as a cutoff point to demonstrate the time-dependence of job mobility throughout careers. In this research, jobs taken in the early and mid-late careers, respectively, refer to jobs starting within first five years and those initially held after (and including) five years in careers. In addition, through the graphical checks, I find that compulsory military service, a life-course event, exerts important influences on the career development of Taiwanese men. Although its effects are as yet unknown, I argue that for research on job mobility in Taiwan, it is necessary to distinguish people with careers interrupted by CMS from the others, at least in the primary stage of analysis. Otherwise, combining them together, we will obtain misleading and spurious results. I will further investigate this issue in Section 4.3. Using the fifth year in careers as a divider to specify career stages, I next illustrate the mechanisms of job change among early and mid-late careers with time-fixed and time-varying covariates derived from relevant theories for people with continuous careers.

### 4.2 TIME-DEPENDENCE OF CAREER DEVELOPMENT

This section further compares the patterns of job mobility in early and mid-late careers. To avoid estimation bias, I exclude from the analysis the jobs of people with careers interrupted by CMS.[61] Some models are conducted separately by gender to further investigate gender differences in job mobility. Table 4.4 lists descriptive statistics for the covariates incorporated in models by gender and the division of people depending on whether their careers were interrupted by CMS. Overall, men have more education (averaging 10.51 years in school) than women (9.08 years). 24.96% of men and 17.41%

[61] After excluding men whose careers were interrupted by CMS, there are 1,378 females (69.07%), 442 males (22.16%) who started their careers after CMS, and 175 males (8.77%) who did not need to take CMS in the rest of the population. In terms of the number of job events, there are 3,343 events (70.14%) held by females, 1,012 (21.23%) for males with careers after CMS, and 411 (8.62%) for males who did not take CMS.

of women hold college degrees, and the gender difference is significant at the .0001 level. With respect to further education, about 10% of both genders have ever taken job-related courses or had earned certificates after schooling. The age of first beginning further education is around 30 years old, about 8 years after first entry into the labor force, on average.

Table 4.4 Descriptive Statistics for Independent Covariates in Model II. Exponential Transition Rate Model of Job Change

| | Men | Women | Total population | People with Careers Interrupted by CMS | People with Continuous Careers |
|---|---|---|---|---|---|
| Number of Respondents | 1422(50.79%) | 1378(49.21%) | 2800 (100%) | 805 (28.75%) | 1995 (71.25%) |
| Number of Jobs (including censored, uncensored, discontinuous jobs) | 4017(54.58%) | 3343(45.42%) | 7360 (100%) | 2594 (35.24%) | 4466 (64.76%) |
| Average and (Standard Deviance) of Total Jobs Held in Careers | 2.99(1.75) | 2.39(1.52) | 2.82 (1.68) | 3.40 (1.73) | 2.57 (1.60) |
| **Education Achievement** | | | | | |
| Years in School | 10.51(4.10) | 9.08(4.70) | 9.81(4.46) | 8.97(3.31) | 10.15(4.81) |
| College degree | 24.96% | 17.41% | 21.25% | 6.95% | 27.08% |
| Further education(dummy, data split at the date of achievement) | 10.27% | 10.23% | 10.25% | 6.34% | 11.83% |
| the age of first attending further education | 30.76(8.48) | 29.31(7.94) | 29.96(8.25) | 31.16(10.22) | 29.70(7.76) |
| the year of first taking further education since working | 7.83(8.92) | 8.42(8.21) | 8.12(8.57) | 12.64(10.26) | 7.16(7.86) |
| **Job History** (unit: person-year) | | | | | |
| General labor force experience | 6.39(6.43) | 4.82(6.53) | 5.74(6.51) | 8.22(6.36) | 4.24(6.14) |
| Firm-specific labor force experience (data split in years) | 6.66(6.85) | 5.76(6.67) | 6.29(6.79) | 6.44(6.62) | 6.21(6.89) |
| Number of previous jobs | 1.31(1.26) | 1.04(1.21) | 1.20(1.25) | 1.56(1.25) | .98(1.19) |
| First job | 29.15% | 42.90% | 34.78% | 16.84% | 45.64% |
| First class (Prestige scale) | 73.21(4.60) | 72.93(4.28) | 73.08(4.45) | 71.46(3.39) | 73.76(4.67) |
| **Life Event** | | | | | |
| Married (dummy, data split at the date of getting married) | 83.97% | 90.93% | 87.39% | 86.09% | 87.92% |
| The age of first getting married | 26.72(3.94) | 23.54(3.57) | 25.10(4.08) | 26.25(3.84) | 24.64(4.08) |
| Entry in parenthood (dummy, data split at the first child's birth) | 79.25% | 88.10% | 83.61% | 82.61% | 84.01% |
| The age of first child born | 27.66(3.98) | 24.53(3.73) | 26.04(4.16) | 27.11(3.73) | 25.61(4.24) |
| **Other Control covariates** | | | | | |
| Birth cohort | | | | | |
| Cohort 1 (1936-51, 45-60 years old, as the reference group) | 32.42% | 30.19% | 31.32% | 35.28% | 29.72% |
| Cohort 2 (1952-61, 35-44 years old in 1996) | 37.90% | 38.61% | 38.25% | 37.52% | 38.55% |
| Cohort 3 (1962-71, 25-34 years old in 1996) | 29.68% | 31.20% | 30.43% | 27.20% | 31.73% |
| Education cohort | | | | | |
| People born before 1956 (as the reference group) | 56.26% | 58.71% | 57.46% | 52.67% | 59.40% |
| People born after 1956 | 43.74% | 41.29% | 42.54% | 47.33% | 40.60% |
| Father's occupation | | | | | |
| Farmers (as the reference group) | 11.90% | 11.68% | 11.79% | 13.14% | 11.24% |
| Owners including self-employed | 36.21% | 34.21% | 35.23% | 44.39% | 31.49% |
| White-collar workers | 26.56% | 26.83% | 26.69% | 16.84% | 30.71% |
| Blue-collar workers | 25.33% | 27.28% | 26.28% | 25.64% | 26.55% |
| Ethnicity (Taiwanese and aborigine as the reference group) | | | | | |
| Mainlander | 12.65% | 11.82% | 12.24% | 8.86% | 13.61% |

Notes: Most figures for covariates present mean values. Standard deviations are in parentheses. For dummy covariates, the percentage when it is equal to 1 is presented. Except for some covariates (as indicated above) using person-year as units, the unit of the descriptive statistics is individual respondent.

In addition, females have substantially more discontinuous job histories than males. Table 4.5 lists the frequencies of normal and discontinuous jobs in different phases of careers. About one fourth of females' jobs terminate with an exit from the labor market (of at least more than one year). In comparison, only 5.63% of male's total jobs are discontinuous, on average. Both genders have more discontinuous jobs in the early phase than in later careers. This implies that jobs starting during early careers are characterized not only by high exit rates, but also by the phenomenon of working "on and off." As a whole, males with careers interrupted by CMS have the lowest percentage of discontinuous jobs (4.90%) in careers, and females are most likely to re-enter the labor market many times throughout their lives.

Table 4.5 Frequencies of Normal and Discontinuous Jobs in Careers

| | Females | | Males with continuous careers | | Males with careers interrupted by CMS | |
|---|---|---|---|---|---|---|
| Career stage | Early | Mid-Late | Early | Mid-Late | Before CMS | After CMS |
| Normal jobs | 1494 (72.67%) | 1024 (80%) | 918 (92.54%) | 406 (94.20%) | 1021 (93.76%) | 1442 (96.07%) |
| Discontinuous jobs | 562 (27.33%) | 256 (20%) | 74 (7.46%) | 25 (5.80%) | 68 (6.25%) | 59 (3.93%) |
| Total number of jobs | 2056 | 1280 | 992 | 431 | 1089 | 1501 |
| Average percentage of discontinuous jobs | 24.52% | | 6.96% | | 4.90% | |

### 4.2.1 Early vs. Mid-Late Careers

Table 4.6 presents the results in exponential rate models for job mobility in early and mid-late careers. Without covariates, average transition rates of job change estimated by a set of raw models are listed in bold in Table 4.6. They are .1204, .1312, and .0990 for total jobs, jobs starting in early career, and those starting in mid-late career, respectively. Because the estimation of parameters in hazard models is sensitive to the number of events, and the number of job episodes in early careers in Model C (n=2379)

is much more than that in the mid-late stage in Model D (n=899), I employ a standardization of event frequencies, in which the number of job changes in mid-late careers serves as the baseline, and using the technique of random selection, number of episodes in early careers is standardized to approximate the baseline (see detailed demonstration in Blossfeld and Rohwer 2002:107-109).

First, notice that discontinuous jobs are very different from normal ones. They have shorter durations and are terminated more quickly, regardless of career stage. The table includes four models. Model A for all jobs is constructed to test Hypothesis IIIa., whether or not Taiwan people hold their first jobs longer than other jobs in their careers. As expected, the result shows that the transition rate of the first job is not significantly different from those of subsequent jobs in careers. Excluding this covariate and including first-class prestige, the other three models in Table 4.6 present different results with and without considering the influence of career stages. The following discussion focuses on differences in job mobility patterns among career stages and also indicates what spurious outcomes may occur if we do not take the time dependence of career mobility into account.

***Education and Job History***

Education has positive effects only for jobs starting in the early career. For jobs initially held in later stages, firm-specific labor force experience takes the place of education and decreases the pace of job shifts over time. These results support Hypotheses IVa. and IVc., in which education as a main indicator of human capital only works for jobs taken in early careers, but work experience becomes increasingly important for job transitions once people enter the labor market. Unexpectedly, pursuing further education has no significant effect on job mobility in the models, and the number of previous jobs continuously shows positive effects throughout careers.

Table 4.6 Mechanism of Job Change among Career Stages for People with Careers not Interrupted by CMS (Exponential Transition Rate Models)

| | All Jobs | | Early Career | Mid-Late Career |
|---|---|---|---|---|
| | **Model A** | **Model B** | **Model C** | **Model D** |
| **Average Transition Rate** | **0.1204** | | **.1312** | **.0990** |
| Constant | -1.91(0.15)*** | -0.22(0.80) | -0.52(0.59) | -2.42(0.09)** |
| Discontinuous Jobs | 0.44(1.56)*** | 0.44(1.55)*** | 0.19(1.21)* | 1.04(2.82)*** |
| Cohort 2 (35-44 years old in 1996) | 0.06(1.07) | 0.06(1.06) | 0.02(1.02) | 0.10(1.11) |
| Cohort 3 (25-34 years old in 1996) | 0.12(1.13) | 0.09(1.10) | 0.18(1.20) | 0.20(1.22) |
| Educational cohort | 0.10(1.10) | 0.08(1.09) | 0.09(1.09) | 0.09(1.09) |
| Father's occupation: Owners | 0.02(1.02) | 0.02(1.02) | -0.02(0.98) | 0.02(1.02) |
| White-collar workers | 0.09(1.10) | 0.10(1.10) | 0.05(1.06) | 0.20(1.23) |
| Blue-collar workers | 0.11(1.12) | 0.12(1.12)* | 0.06(1.06) | 0.15(1.17) |
| Ethnicity: Mainlanders | 0.12(1.12)* | 0.12(1.12)* | -0.01(0.99) | 0.11(1.12) |
| Sex | -0.21(0.81)*** | -0.21(0.81)*** | -0.30(0.74)*** | -0.05(0.95) |
| **Covariates of Human Capital** | | | | |
| Education (school year) | 0.01(1.01) | 0.02(1.02)* | 0.03(1.03)* | -0.00(1.00) |
| College | -0.06(0.94) | -0.01(0.99) | -0.05(0.95) | -0.10(0.90) |
| Further education | 0.01(1.01) | 0.02(1.02) | 0.17(1.18) | -0.08(0.92) |
| **Job History Covariates** | | | | |
| General labor force experience | 0.01(1.01) | 0.01(1.01) | 0.01(1.01) | -0.02(0.98) |
| Firm-specific labor force experience | -0.05(0.95)*** | -0.05(0.95)*** | 0.00(1.00) | -0.07(0.93)*** |
| Number of previous job | 0.09(1.10)*** | 0.09(1.09)*** | 0.15(1.16)* | 0.08(1.09)** |
| First job | **-0.00(1.00)** | _ | | _ |
| First class (Prestige) | _ | -0.02(0.98)*** | -0.02(0.98)* | 0.00(1.00) |
| **Life Event Covariates** | | | | |
| Married | -0.21(0.81)** | -0.20(0.82)** | -0.14(0.87) | -0.15(0.86) |
| Parenthood | -0.41(0.66)*** | -0.42(0.66)*** | -0.50(0.61)** | -0.34(0.71)* |
| **Labor Market Conditions** | | | | |
| CE1: Industrialization | 0.45(1.57)*** | 0.46(1.59)*** | 1.08(2.95)*** | -0.01(0.99) |
| CE2: Economic cycle | -0.03(0.97)* | -0.04(0.96)* | -0.10(0.91)** | -0.04(0.96) |
| PE1: Industrialization | -0.17(0.85)* | -0.17(0.85)* | -0.80(0.45)*** | 0.24(1.27) |
| PE2: Economic cycle | 0.03(1.03) | 0.03(1.03) | 0.08(1.08)* | -0.06(0.94) |
| Number of events | 3278 | 3278 | 897 | 899 |
| Log likelihood (final estimates) | -9279.5594 | -9269.1994 | -2465.7840 | -2709.1250 |
| Likelihood-ratio statistics (Model $\chi^2$) | 1624.3228*** | 1645.0430*** | 460.4234*** | 476.2754*** |
| Degrees of freedom | 22 | 22 | 22 | 22 |

Note: * Statistically significant at 0.05 level, ** at 0.01 level, *** at 0.001 level. The relative risk ratio is in parentheses. Model $\chi^2$ is the fit of the current model compared to that of the null model (Powers and Xie 2000: 63-71).

***Life Events***

Getting married does not provide any significant effects in the models. Throughout all periods in careers, entry into parenthood decreases individuals' rate of job change. People who have children have transition rates of job change that are about 30% to 40% lower than people without children.[62] The effects of having children are stronger for jobs undertaken in the early stage than those in mid-late careers.

***Labor-Market Conditions***

Comparing Models C and D, job mobility for early jobs is very sensitive to labor-market conditions, and both cohort effects and period effects show strong influences on job mobility. For jobs initially held in the later career stage, however, transitions are not affected by external changes in labor-market conditions. In Model C, the positive effect of industrialization level at the time of first entry into the labor force (CE1) supports Hypothesis IVd., which holds that the later people enter the labor force, the higher level of industrialization in the country and the more often people tend to change jobs, because there is more occupational differentiation in the labor market. The relative risk change reaches 2.95, in other words, a 195% increase in transition rates of job change for an increase of one factor score in the level of industrialization in Taiwan. The condition of the economic cycle when careers begin (CE2) has negative effects on job exits in the early career. Because there are more job openings in the labor market during times of economic prosperity, people starting their careers at this time tend to find jobs more fitting for them, which further reduces the likelihood that they will subsequently change jobs. The period effects of labor-market conditions at the year of job change are designed to capture the instant effects of structural change on job mobility. My results show that

[62] The relative risk change of parenthood in Model C and Model D are 0.61 and 0.71, respectively. Therefore, entering into parenthood decreases individuals' by 29% to 39% (i.e., 1-61%=39%; 1-71%=29%).

only jobs starting in early careers are affected by period effects in the labor market. Flourishing economic conditions (PE2) encourage job mobility, but transition rates of job change decrease by an increasing level of industrialization (PE1) in society over time.

***Stage-Specific Effect of Covariates***

Comparing the outcomes in Model B with those in Models C and D, we find that many effects shown in the total model are actually stage-specific. For example, there is a gender difference in job mobility, according to the results estimated in Model B for all jobs held in careers. When we separate jobs starting in different career stages, however, we find that the gender difference mainly happens in the early stage and that males have transition rates one fourth lower than females for early jobs. Similarly, the negative effect of first-class prestige estimated in Model B is insignificance in the models for jobs initially held in mid-late careers (Model D). This means that initial class position, which is the most influenced by family background, constrains job mobility only for those jobs undertaken early in careers, but does not influence the exit rates for jobs initially held in later career stages. Other covariates showing spurious effects in the total model but that are actually stage-specific include education, firm-specific labor force experience, and labor-market conditions. In addition, the negative effect of getting married in Model B disappears in the models of different career stages, probably because of its complicated interactions with gender and career stages. This complication will be disentangled in the following analyses.

***Summary***

In brief, job mobility for jobs beginning in early careers is more influenced by background characteristics (e.g., sex, education, initial-class prestige) and labor-market conditions. Conversely, jobs started in the mid-late phase are stable and less affected by

individual characteristics and external changes in structure. No gender differences exist in job mobility. Only firm-specific experience, the number of previous jobs, and entry into parenthood help explain the likelihood of job exits in this phase. With respect to the total model for all jobs in careers, consistent with my argument, the results mix the effects operating during different career periods and fail to detect the unique pattern of job change in the early phase.

### 4.2.2 Gender Differences in Early Careers

In this section, I further investigate gender differences of job mobility in early careers. Figure 4.4 displays the trajectories of transition rates estimated by piecewise constant exponential models for both genders. We can see that females have much higher rates in early careers than in later careers and that their trajectory of job mobility in mid-late careers is parallel to males' in early careers. In other words, for jobs starting during early careers, males enjoy transition rates as low as those in females' mid-late careers.

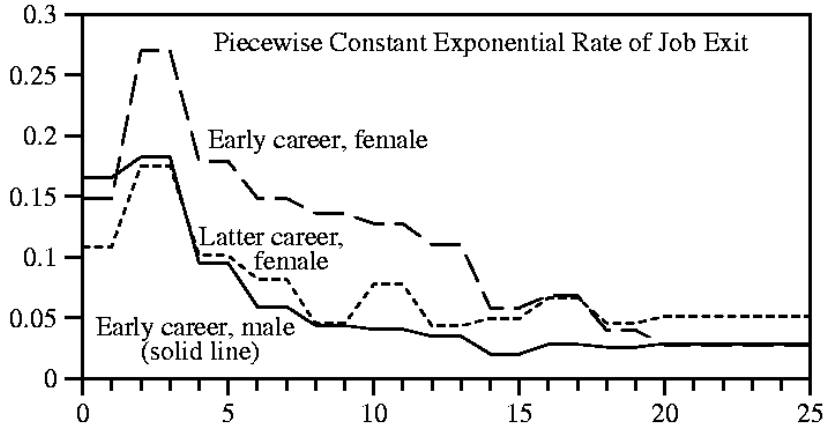


Figure 4.4 Comparison of Job Mobility between Genders, Piecewise Constant Exponential Rates (in 2-Year Interval)

To quantify these findings, Table 4.7 presents the average transition rates estimated by exponential rate models among career stages for both genders. We can see that there is no significant difference among career stages in terms of average transition rates for males whose careers are not interrupted by CMS. For females, jobs beginning in early careers have particularly high rates of exit and those initially taken in later careers have transition rates similar to the average transition rates throughout males' careers.

Table 4.7 Estimated Transition Rates of Job Change for People with Careers not Interrupted by CMS

| Estimated Transition Rates | Early Career | Mid-Late Career | Total |
|---|---|---|---|
| People with careers not interrupted by CMS | .1312 | .0990 | .1204 |
| Females | .1546 | .1011 | .1341 |
| Males | .0936 | .0921 | .0932 |

Bearing this finding in mind, Table 4.8 presents the gender differences of job mobility in early careers in exponential rate models. Because the number of job changes undertaken in early careers of females (n=1722) is much more than that of males, the number is standardized to approximate the size of males' job transitions of early careers (n=657).[63]

[63] For the rationale and a detailed demonstration for episode standardization, please refer to Blossfeld and Rohwer (2002:107-109).

Table 4.8 Gender Difference of Job Mobility in Early Careers for People with Careers not Interrupted by CMS (Exponential Transition Rate Models)

| | **Females** | **Males** |
|---|---|---|
| Average Transition Rate | **.1546** | **.0936** |
| Constant | -1.11(0.33) | 0.70(2.01) |
| Discontinuous jobs | 0.09(1.09) | 0.76(2.15)*** |
| Cohort 2 (35-44 years old in 1996) | -0.07(0.93) | 0.10(1.11) |
| Cohort 3 (25-34 years old in 1996) | 0.13(1.14) | 0.06(1.06) |
| Educational Cohort | 0.13(1.14) | 0.06(1.06) |
| Father's occupation owners | -0.04(0.96) | 0.01(1.01) |
| White-collar workers | 0.00(1.00) | 0.14(1.15) |
| Blue-collar workers | -0.01(0.99) | 0.23(1.26) |
| Ethnicity: Mainlanders | -0.06(0.94) | 0.24(1.27)* |
| **Covariates of Human Capital** | | |
| Education (school year) | 0.03(1.03) | 0.02(1.02) |
| College | -0.26(0.77)† | 0.26(1.30)* |
| Further education | -0.13(0.88) | 0.30(1.35)* |
| **Job History Covariates** | | |
| General labor force experience | 0.03(1.03) | -0.06(0.94) |
| Firm-specific labor force experience | 0.03(1.03) | -0.08(0.92)*** |
| Number of previous jobs | 0.15(1.17)† | 0.15(1.17)* |
| First class (Prestige) | -0.01(0.99) | -0.04(0.96)*** |
| **Life Event Covariates** | | |
| Married | -0.10(0.90) | -0.48(0.62)** |
| Parenthood | -0.77(0.46)*** | 0.02(1.02) |
| **Labor Market Conditions** | | |
| CE1: Industrialization | 1.16(3.18)*** | 0.51(1.67) |
| CE2: Economic cycle | -0.06(0.94) | -0.08(0.92)* |
| PE1: Industrialization | -0.81(0.44)** | -0.22(0.80) |
| PE2: Economic cycle | 0.07(1.07)† | 0.04(1.04) |
| Number of events | 645 | 657 |
| Log likelihood (final estimates) | -1713.3308 | -1919.9294 |
| Likelihood-ratio statistics (Model $\chi^2$) | 250.9124*** | 541.5652*** |
| Degrees of freedom | 21 | 21 |

Note: † statistically significant at the 0.1 level, * at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses. Model $\chi^2$ is the fit of the current model compared to that of the null model (Powers and Xie 2000: 63-71).

The gender difference in early careers mainly occurs through three aspects: the covariates of human capital, life events, and labor-market conditions. For women, jobs taken in the early stage are very sensitive to labor-market conditions, but for men jobs are hardly affected by the external structure except for a weak cohort effect of economic cycle. The influence of life events on job change is a little complicated, however. Getting married strongly stabilizes men's employment in early careers (decreasing transition rates by 38%),[64] but has no effect for women. However, having the first child helps terminate women's jobs by reducing the transition rate by 54%, but does not significantly impact males' early employment.

With regard to the covariates of human capital and job history, only college degree and number of previous jobs are associated with early-stage mobility for both genders. In addition, further education, firm-specific experience and first status prestige work only for men. In particular, when genders are specified, the effects of a college degree that are insignificant in the joint model (Model C of Table 4.6) actually have contrary effects for the two genders. The negative effect of a college degree helps women have relatively stable employment in relation to highly mobile careers for other women, but a college degree accelerates men's pace of job searching in the early phase via increasing rates of job change by 30%.[65]

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[64] Given this finding, the negative effect of getting married shown in the total model (Model B of Table 4.6) actually takes place in males' early careers. Because females become the majority in the rest of the population after excluding males who start their careers before CMS (28.75% of the total population), the results in Model C of Table 4.6 are basically females' patterns of mobility in early careers, and the negative effect of getting married for males is suppressed in the model. Therefore, the effect of getting married for males emerges only after separating the sample by gender.

[65] In Taiwan, the regulatory age to begin military service is over 18 years old, and attending college can postpone the timing of taking CMS through draft deferrals. As a consequence, 73.08% of males in this group having an undergraduate or graduate degree.

In addition, only men enjoy the benefits of completing further education after schooling. Further education provides the latest update on people's human capital after leaving school. For its dynamic measurement at the time of achievement, the effect of further education is the strongest among the three human capital covariates. It increases men's job mobility transition rates by 35%. Moreover, men's jobs taken in early careers are also affected by the covariates of job history (i.e., firm-specific labor force experience and the number of previous jobs) in a manner similar to that which occurs in mid-late careers, as indicated in Model D in Table 4.6. If we treat the covariate of firm-specific labor force experience as an indicator of duration effects of job holding, its negative effect for men means that for jobs starting in the early stage of careers, the risks of leaving a job decrease with increasing duration of a job for men, but for women, exit rates do not change with job duration.

In a nutshell, females' early-career job mobility is more influenced by external conditions in the labor market, whereas males' early careers are more controlled by their own achievement, such as further education and job histories in the labor market.

### 4.2.3 Summary

Given the findings presented above, two main points characterize the distinct patterns of job mobility during career stages. First, the time-dependence of career development is supported in my research in terms of not only decreasing levels of transition rates, but also the differing patterns of job mobility among career stages. Employment that begins in early careers has a high risk of termination and is very sensitive to labor-market conditions, as well as such individual background characteristics as education and initial class position. For jobs initially taken in mid-late careers, mobility is mainly affected by previous job history, and not by external changes in the labor market. Second, gender differences in job mobility occur mainly for jobs

beginning in early careers. For jobs initially taken in later careers, there is no gender difference in patterns of job change. Note that findings presented in this section are only for people with careers not interrupted by CMS. After analyzing the people with careers interrupted by CMS in next section, we will have a complete picture of the time dependence of career development for Taiwan people.

## 4.3 JOB MOBILITY FOR PEOPLE WITH CAREERS INTERRUPTED BY CMS

In Taiwan, jobs held before CMS have been regarded as stopgaps before the formal careers starting after CMS, and as such, few researchers pay attention to CMS's role in career development. This section primarily explores the time-dependence of job mobility for men who start their careers before beginning CMS in Taiwan. Graphs in Section 4.3.1 indicate that the survivor functions and levels of transition rates are very different for jobs taken before and after CMS, but there is no significant time-dependence of job mobility within careers after CMS, which researchers have regarded as men's formal careers. According to this finding, in Section 4.3.2 I analyze patterns of job mobility before and after CMS under the assumption that jobs taken before CMS are stopgaps and unimportant to their career development after re-entering the labor market from the military. Under this assumption, Section 4.3.3 includes information job histories before CMS to examine whether or not work experience before CMS influences job mobility after CMS.

### 4.3.1 Transition Rates of Job Mobility before and after CMS

Because taking CMS constitutes a career interruption, it is not appropriate to apply the division of career stages set for investigating continuous careers as was used in the last section. I differentiate three periods in careers to preliminarily investigate career development for this group: jobs held before CMS, jobs starting with the first five years

and after five years after re-entry into the labor market from the military. Figure 4.5 shows survivor functions in the three periods. The distinction between jobs taken before and after CMS is obvious. For the former, jobs exits occur rapidly and after 10 years all jobs are terminated for taking CMS. With respect to careers after CMS, survivor functions for jobs starting in first five and after five years basically have minor differences, and both groups have very gradual slopes compared to that of careers before CMS.

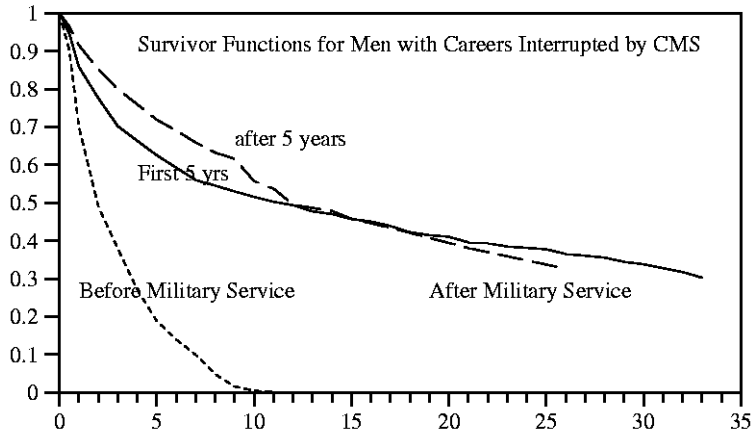


Figure 4.5 Survivor Functions of Job Mobility for Men with Careers Interrupted by CMS

Figure 4.6 draws the shapes of transition rates estimated by piecewise constant exponential models with 2-year time intervals for careers before and after CMS. The statistical outcomes show significant differences in rates among two-year intervals of duration. For simplification, I do not specify different stages for jobs taken after CMS. First, notice that the scale of the vertical axis in Graph (G) is 10 times greater than that in Graph (H). For careers before CMS, the estimated rates steeply increase with duration increasing by time. Since a transition rate is a density function divided by its survivor function, the transition rates in Graph (G) become extremely high (even higher than 1) when the survivor function of jobs before CMS moves toward zero during the 8-10 years

of duration. In Graph (H), careers after CMS have normal-shaped transition rates changing by time. No significant differences in rates exist between jobs starting within the first five or after five years in this period. The average transition rate is 0.0590, even lower than that of mid-late careers for males with careers not interrupted by CMS ($r$ = 0.0921). According to these findings, for this group of people, CMS is a watershed mark of their careers because employment before and after CMS is very different in terms of transition rates. The next section further explores the mechanisms of job mobility between these two career periods.

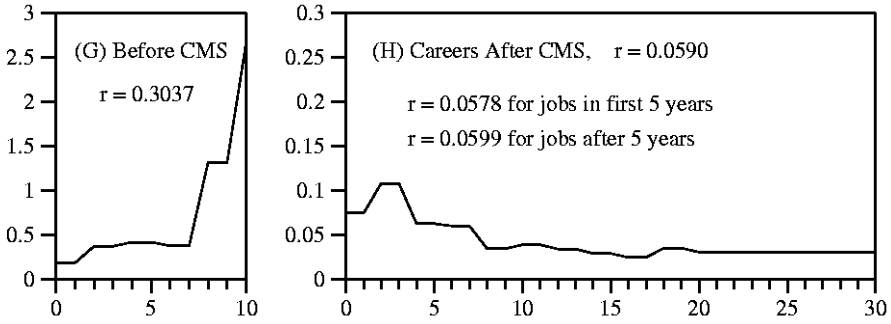


Figure 4.6 Piecewise Constant Exponential Rates (in 2-Year Intervals) of Job Change Comparison of Careers Before and After Military Service

### 4.3.2 Job Mobility Before and After Compulsory Military Service

Compared to the other groups in the population, this group has a low level of education (see last two columns of Table 4.4). Only 6.95% of them have a college degree in relation to 27.08% of the others. They leave school early (after 8.97 years in school, on average), and fewer of them (6.34%) pursue further education while working. If they do, that occurs an average of 12.64 years (excluding the time taken in CMS) after the time of first entry into the labor market. Others achieve higher education (10.15 years in school), and 11.83% of them have additional education 7.16 years after working, on average.

Table 4.9 lists basic information about careers before CMS. People start to work around 15 years old[66] and begin CMS around age 20. They work an average of five years before CMS. Within this period, 72.81% of people have only one job, and the average number of jobs taken before CMS is 1.37.

Table 4.9 Basic Information of Careers before CMS

| | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| Age of first entry into labor market | 15.76 | 2.50 | 12 | 26 |
| Age of taking CMS | 20.72 | 1.14 | 17 | 29 |
| Working years before CMS | 4.96 | 2.64 | 0.5 | 16 |
| Number of jobs taken before CMS | 1.37 | .71 | 1 | 5 |
| Total number of respondents | | 792 | | |

On the basis of the graphical inspection presented above, I find that CMS serves as a watershed mark dividing the careers of this group of men into a rushed, short period before CMS and a stable period after CMS. Using this career division, Table 4.10 presents the patterns of job mobility estimated by exponential rate models. Four models are included in the table. Including a dummy covariate of first job, Model A tests whether or not this group of people holds first jobs longer than subsequent ones held in their lives. Excluding this covariate and including initial-class prestige in models, Model B to Model D examine the mechanisms of job mobility for all jobs, careers before CMS, and after CMS, respectively. Because the number of job changes undertaken before CMS in Model C (n=1050) is much more than that after discharging from CMS, the number is standardized to approximate the size of job transitions after CMS in Model D (n=771). Note that in this analysis I assume that work experience before CMS is not important to

[66] While there is no cohort difference in the average age of beginning CMS, the average age of first entry into labor market is different by birth cohorts in this group. Therefore, there are differences in the average number of years working before CMS among birth cohorts. Basically young people start working later than older ones. The average ages of first entry into the labor force are 14.76, 15.86, and 16.99 years old for birth cohorts of 1936-1951, 1952-1961, and 1962-1971, respectively. Hence, the average numbers of years working before CMS for these cohorts are 6.28, 4.78, and 3.52.

the career development after CMS, and therefore, the model of job mobility after CMS (Model D) only contains information after CMS.[67]

Although discontinuous jobs are few for this group of people (accounting for 4.90% of all jobs), they are quite different from normal jobs. Their transition rates are 3.16 and 1.49 times the exit rates of normal jobs taken before and after CMS, respectively. In Model A, first jobs of people with careers interrupted by CMS have higher risks of termination, and they have almost double the transition rates of the other jobs taken throughout careers. First jobs after re-entry into the labor force from the military, however, do not have transition rates significantly different from other jobs taken after CMS in a model of careers after CMS (not shown here). With regard to the effects of initial class position, differing from people with continuous careers, it does not have any impact on job mobility for this group of people, but first class position after CMS shows a minor and negative effect on job change after CMS in Model D.

[67] To be specific, there are five covariates in Model D only using the information after CMS: general labor force experience, number of previous jobs, first class, and two covariates of cohort effects of labor-market conditions. For example, first class refers to the first class after CMS, and the starting point for general labor force experience and number of previous jobs is the time of re-entry into the labor market from the military.

Table 4.10 Mechanisms of Job Change Before and After CMS for Males with Careers Interrupted by CMS (Exponential Transition Rate Models)

| | All Jobs | | Before CMS | After CMS |
|---|---|---|---|---|
| | **Model A** | **Model B** | **Model C** | **Model D** |
| Average Transition Rate | **.1097** | | **.3037** | **.0590** |
| Constant | -1.54(0.22)*** | -0.35(0.70) | -2.71(0.07)** | -0.56(0.57) |
| Discontinuous jobs | 0.64(1.90)*** | 0.57(1.77)*** | 1.43(4.16)*** | 0.91(2.49)*** |
| Cohort 2 (35-44 years old in 1996) | 0.01(1.01) | 0.02(1.02) | -0.14(0.87) | -0.17(0.84) |
| Cohort 3 (25-34 years old in 1996) | -0.03(0.98) | 0.02(1.02) | -0.72(0.49)** | -0.12(0.89) |
| Educational Cohort | -0.10(0.91) | -0.09(0.91) | -0.18(0.84) | -0.06(0.95) |
| Father's occupation: Owners | -0.12(0.88) | -0.11(0.90) | -0.04(0.96) | -0.17(0.84) |
| White-collar workers | 0.03(1.03) | 0.05(1.05) | 0.10(1.10) | 0.20(1.23) |
| Blue-collar workers | -0.04(0.96) | -0.02(0.98) | -0.11(0.90) | 0.08(1.08) |
| Ethnicity: Mainlanders | -0.01(0.99) | -0.01(0.99) | -0.06(0.94) | 0.06(1.06) |
| **Covariates of Human Capital** | | | | |
| Education (school year) | 0.02(1.02) | 0.01(1.01) | 0.09(1.10)*** | 0.02(1.02) |
| College | 0.07(1.07) | 0.13(1.14) | -0.22(0.80) | 0.13(1.14) |
| Further education | 0.17(1.19) | 0.17(1.18) | 0.00(1.00) | 0.36(1.44)* |
| **Job History Covariates** | | | | |
| General labor force experience | -0.01(0.99) | -0.05(0.96)*** | 0.23(1.26)*** | -0.03(0.97) |
| Firm-specific labor force experience | -0.00(1.00) | -0.01(0.99) | 0.22(1.24)*** | -0.08(0.93)*** |
| Number of previous jobs | 0.17(1.18)*** | 0.07(1.07)* | 0.04(1.04) | 0.13(1.14)* |
| First job | **0.67(1.95)*** ** | _ | | _ |
| First class (Prestige) | | -0.01(0.99) | 0.02(1.02) | -0.02(0.98)* |
| **Life Event Covariates** | | | | |
| Married | -0.48(0.62)** | -0.56(0.57)*** | 0.60(1.83)* | -0.54(0.58)*** |
| Parenthood | -0.32(0.72)* | -0.23(0.79) | -0.09(0.92) | 0.01(1.01) |
| **Labor Market Conditions** | | | | |
| CE1: Industrialization | 1.00(2.72)*** | 0.86(2.37)*** | 1.75(5.74)*** | 0.08(1.08) |
| CE2: Economic cycle | -0.08(0.92)** | -0.07(0.93)** | -0.11(0.90)* | -0.06(0.94) |
| PE1: Industrialization | -0.39(0.67)*** | -0.36(0.70)*** | -0.45(0.63) | 0.29(1.33) |
| PE2: Economic cycle | 0.01(1.01) | 0.00(1.00) | 0.01(1.01) | -0.05(0.95) |
| Number of events | 1281 | 1281 | 776 | 771 |
| Log likelihood (final estimates) | -5075.0088 | -5109.4822 | -1533.1555 | -2733.8486 |
| Likelihood-ratio statistics (Model $\chi^2$) | 1382.121*** | 1313.174*** | 272.2246*** | 376.3396*** |
| Degrees of freedom | 21 | 21 | 21 | 21 |

Note: * Statistically significant at 0.05 level, ** at 0.01 level, *** at 0.001 level. The relative risk ratio is in parentheses. Model $\chi^2$ is the fit of the current model compared to that of the null model (Powers and Xie 2000: 63-71).

Basically, the distinctions of job change before and after CMS are parallel to the differences between early and mid-late careers for people with careers not interrupted by CMS. First, labor-market conditions at the time of first entry have strong impacts on jobs in the earlier phase, but structural conditions at the time of re-entry into the labor market from the military do not affect job mobility after CMS. In Model C, for example, the industrialization level at the time of first entry into the labor market (CE1) strongly influences the speed of job change before CMS. Each one-factor-score increase in the level of industrialization raises exit rates by 4.74 times. Second, education works only in the former periods, but loses significance in later ones. Conversely, covariates of job history exert their influences mostly in the later phases, when firm-specific labor force experience stabilizes the pace of job change by time and the number of previous jobs significantly predicts one's tendency of job mobility in the labor market.

In addition, several findings differ from those found in Section 4.2. Interestingly, getting married has a complex influence on job mobility over the course of careers, while it shows negative effects in the total model. Entry into marriage accelerates job exit rates before CMS by 83%, but stabilizes careers after CMS by decreasing exit rates 42%, *ceteris paribus*. Entry into parenthood, however, has no impact on their careers. For job mobility before CMS, both general and firm-specific labor force experiences have significant effects in Model C. Given the assumption of constant rates in exponential rate models, their positive effects imply that the trajectory of job change during this period is an accelerated process, with its transition rate rising continuously over time (as shown in Graph [G] of Figure 4.6). For careers after CMS, which are characterized by its particularly low transition rates, males who complete further education see their transition rates increase 44% more than that that of their counterparts who do not invest more in their human capital after schooling.

### 4.3.3 Influence of Job Histories Before CMS

Releasing the assumption that jobs taken before CMS are stopgap jobs between leaving school and engaging in CMS, this section further analyzes influences of working experience before CMS on career development after re-entering the labor force from the military. Model E in Table 4.11 includes information about job histories before CMS to examine whether or not it helps improve our understanding about job mobility after CMS by comparing the outcomes with Model D, which only uses information after CMS to explain job mobility during this period.[68] Five covariates in Model E: general labor force experience, number of previous jobs, first class, and two covariates of cohort effects of labor-market conditions (Industrialization and economic cycle), trace back to the starting point of first entry into the labor force before CMS. The estimated results of these covariates are shown in bold in Table 4.11.

[68] Model Ds in Tables 4.10 and 4.11 are identical.

Table 4.11 Influences of Job Histories before CMS on Job Mobility after CMS for Males with Careers Interrupted by CMS (Exponential Transition Rate Models)

| | **Career After CMS** | |
|---|---|---|
| | **Model D** | **Model E** |
| Average Transition Rate | **.0590** | |
| Constant | -0.56(0.57) | -0.81(0.45) |
| Discontinuous jobs | 0.91(2.49)*** | 0.88(2.41)*** |
| Cohort 2 (35-44 years old in 1996) | -0.17(0.84) | -0.18(0.84) |
| Cohort 3 (25-34 years old in 1996) | -0.12(0.89) | -0.31(0.73) |
| Educational Cohort | -0.06(0.95) | -0.18(0.84) |
| Father's occupation: Owners | -0.17(0.84) | -0.16(0.86) |
| White-collar workers | 0.20(1.23) | 0.18(1.19) |
| Blue-collar workers | 0.08(1.08) | 0.08(1.08) |
| Ethnicity: Mainlanders | 0.06(1.06) | 0.05(1.05) |
| **Covariates of Human Capital** | | |
| Education (school year) | 0.02(1.02) | -0.01(0.99) |
| College | 0.13(1.14) | 0.15(1.16) |
| Further education | 0.36(1.44)* | 0.33(1.38) † |
| **Job History Covariates** | | |
| General labor force experience | **-0.03(0.97)** | **-0.01(0.99)** |
| Firm-specific labor force experience | -0.08(0.93)*** | -0.06(0.94)*** |
| Number of previous jobs | **0.13(1.14)*** | **0.12(1.12)***** |
| First class (Prestige) | **-0.02(0.98)*** | **-0.01(0.99)** |
| **Life Event Covariates** | | |
| Married | -0.54(0.58)*** | -0.53(0.59)*** |
| Parenthood | 0.01(1.01) | 0.00(1.00) |
| **Labor Market Conditions** | | |
| CE1: Industrialization | **0.08(1.08)** | **0.66(1.93)*** |
| CE2: Economic cycle | **-0.06(0.94)** | **-0.11(0.90)*** |
| PE1: Industrialization | 0.29(1.33) | 0.12(1.12) |
| PE2: Economic cycle | -0.05(0.95) | -0.04(0.96) |
| Number of events | 771 | |
| Log likelihood (starting value) | -2922.0184 | |
| Log likelihood (final estimates) | -2733.8486 | -2732.0259 |
| Likelihood-ratio statistics (Model $\chi^2$) | 376.3396*** | 379.985*** |
| Degrees of freedom | 21 | 21 |

Note: * statistically significant at 0.05 level, ** at 0.01 level, *** at 0.001 level, and "†" at 0.10 level. The relative risk ratio is in parentheses. Model $\chi^2$ is the fit of the current model compared to that of the null model (Powers and Xie 2000: 63-71).

While both models provide a good fit to the data, Model E does not have much more power of explanation than Model D when the additional covariates are included.. The difference in model $\chi^2$ between Models D and E is 3.6454, which is not statistically significant at the 0.05 level (Powers and Xie 2000: 69-71). The estimated effects of most covariates in the models are quite similar except for two covariates.[69] First, job mobility after CMS is affected only by initial class position assumed at re-entry into the labor force after military service, and not by initial class at first entry into the labor market. Second, and importantly, the cohort effects of labor-market conditions before CMS strongly influence job mobility after CMS. In Model E, for example, the industrialization level of the country at the time of first entry into the labor force is positively associated with the speed of job change after CMS, and its effect is strong (the relative risk change is 193%). In contrast, conditions of the labor market at the time of re-entering it from the military do not impact careers after CMS (Model D).

In brief, cohort effects of the labor market at the time of first entry into the labor force strongly influence one's tendency of job change and its effect is still experienced after CMS, even though adding information about job histories before CMS does not much improve our understanding of job mobility after CMS.

### 4.3.4 Summary

Most men (close to 90%) in Taiwan have engaged in compulsory military service at some time in their lives, and more than half of them (56.61% in our sample) started their careers before CMS. Perhaps the experience of CMS for men is so common in Taiwan that researchers rarely examine it. We know little about the change in careers

[69] Taking a closer look, the effects of further education shown in these two models are also different. While the positive effect of further education in Model D becomes insignificant at the 0.05 level in Model E, it is significant at the 0.1 significance level in Model E (the p value is 0.0556).

before and after taking CMS, much less understand the influence of working experiences before CMS on individuals' subsequent career development. Through graphical inspections, I found that the job histories for males with careers interrupted by CMS, are comprised of a short period with accelerated job exits before CMS and a long period of stable employment after CMS.. The mechanisms of job change in each of these periods are distinct as well.

Careers before CMS serve as a job-shopping stage for this group of people. They exit first jobs faster than other jobs, but first-job status does not have any impact on subsequent mobility. Both general and firm-specific labor force experiences show positive effects; in other words, the longer a man works, the faster he tends to quit, and labor-market conditions seriously influence employment in this period. These findings all reveal a brief period of rapid transitions in which people hardly can control their careers. After experiencing this short period, however, people directly enter into stable employment with very low rates of job change after mustering out of the military. The average level of transition rates is even lower than that in the mid-late careers of males with continuous careers. The first jobs upon re-entering the labor force from the military do not have significantly different transition rates compared to subsequent jobs, but the first class position held after CMS constrains the pace of job mobility in this period. Firm-specific labor force experience shows negative duration effects of job holding, and further education after schooling becomes the major momentum for job change in this period. In other words, employment after CMS is more controlled by individuals, and less by external changes in the labor market. In addition, getting married has contrary influences among these periods, despite its negative effect in the models of total jobs. Marriage fosters job mobility before CMS, but stabilizes employment in careers after CMS.

Regarding the alternative hypotheses of whether work experience before CMS helps reduce the time and efforts people pay for job matching after CMS or whether people need to engage in job search all over again, according to the findings presented above, the former is supported, though we do not know the exact mechanism that facilitates it. To further examine whether job histories before CMS help explain job mobility after CMS, I compare the results of job mobility estimated with and without using the information before CMS. This does not generate any new outcomes, except that the cohort effects of labor-market conditions at the time of first entry into the labor force continuously influence the pace of job mobility after CMS.

## 4.4 Summary and Discussion

This chapter aims to reveal the time-dependence of job mobility in careers. Considering the different timing of CMS taken by males, the analyses are conducted separately for two groups, people with careers interrupted by CMS and those with continuous careers. Through a graphical inspection of survivor functions and estimated transition rates, I find heterogeneity in the trajectories of the population's career mobility. For males, CMS is a potentially major event interrupting their careers. Parallel to the argument from the life-course perspective (Hogan 1978; Elder 1975), which holds that the order of life events is important to individual development in the life cycle, the timing of taking CMS (i.e., before or after first entry into the labor force), is crucial to the trajectories of job mobility in their careers. Males with careers interrupted by CMS experience a rush period with extremely high rates of job exits before CMS and directly enter into stable employment characterized by very low transition rates after discharging from CMS. For the other people, jobs taken in the earlier stage generally have higher transition rates in relation to those initially held in later careers.

***Time-Dependence of Job Mobility***

With regard to differences in job change among career stages, briefly, jobs starting in the early phase are sensitive to the external structure of the labor market (including both cohort effects and period effects) and attributes accounting for background influence, such as schooling and first class position. For those taken in mid-late careers, their transitions are more controllable, and mainly affected by individual job histories and further education completed after schooling.

During the beginning of careers, job shopping and matching are intense. Education is a major form of human capital by which people attain their first job (Sakamoto and Powers 1995). Highly educated people are prone to searching for jobs more fully than their counterparts with lower education, but as time goes by, the effect of this time-fixed measurement is replaced by other kinds of accruing human capital. Firm-specific labor force experience, for example, displays negative effects on job mobility and more importantly, further education undertaken after schooling strongly fosters job mobility, even though it affects only males in the analyses. This finding provides primary support for the argument derived from human capital theory: that investment in human capital leads to corresponding status attainment.

For the influences of first job and first class, as expected, Taiwan people do not hold their first jobs longer (or shorter) than other jobs held in careers, except for first jobs with shorter duration taken by males with careers interrupted by CMS. First class constrains the pace of job mobility for jobs beginning in early careers and loses it effects for those initially held in mid-late careers. But for males with careers interrupted by CMS, it is the first class attained after re-entry into the labor force from military, not the class at first entry, which has negative effects on job mobility after CMS. In addition, labor-market conditions seriously affect transition rates of early jobs, but fail to explain

mobility for later jobs. Two factors, industrialization level and economic cycle, are constructed using nine annual indicators from 1953 to 1996 as proxies of labor-market conditions. As hypothesized, people who start their careers at the same time encounter the same labor-market conditions, and these cohort effects of the labor market seriously influence people's tendency of job mobility, especially for jobs taken in early careers. For males with careers interrupted by CMS, the cohort effects of the labor market persist even for careers after CMS.

***Careers Before CMS***

One objective in this section is to identify the functions of jobs taken before CMS in career development for males with careers interrupted by CMS. Is work experience before CMS helpful, or just a stopgap between leaving school and starting CMS? I analyze this question in two ways. Through investigating differences in levels of transition rates among these career periods, the particularly stable employment in careers after CMS implies that either work experience before CMS or experience in the military helps people avoid prolonged job searches and allows them to easily be matched to jobs after re-entering the labor market from the military. Including information about work experience before CMS in the model to analyze job mobility after CMS, I then compare the results with those estimated only by information after CMS to determine whether adding the information improves our understanding about job mobility after CMS. My results yield no simple answer. Job mobility after CMS is well explained using only information after CMS, and most covariates show similar effects after extending the range of information to careers before CMS. There is an exception, however, in that the cohort effects of labor-market conditions at the time of first entry into the labor force continuously have strong effects on job mobility after CMS. These findings tell us that the influence of CMS on one's career is a complex issue. The analyses in this chapter

provide only a preliminary exploration of differences transition rates and in patterns of job mobility before and after CMS.

***Gender Differences***

Gender differences in job mobility mainly take place in early careers, when females have much higher exit rates than males. In mid-late careers, females' exit rates become smaller and are not significantly different from those for males. Males with careers not interrupted by CMS, in contrast, enjoy relatively stable careers since the very beginning. Both genders have discontinuous jobs in their lives, more during early careers and fewer later. Discontinuous jobs have exit rates significantly higher than normal jobs for both genders. Although males have much lower proportions of discontinuous jobs than females, their discontinuous jobs seriously increase transition rates of job change throughout careers. For men with careers not interrupted by CMS, the exit rates of discontinuous jobs are more than twice the exit rates of normal jobs. For those with careers interrupted by CMS, discontinuous jobs have rates 368% and 149% higher than those of normal jobs before and after CMS, respectively. For females, temporary withdrawal from the labor market in early stages makes no difference on exit rates in spite of a high proportion of discontinuity (27.33%) occurring in this period. But for the jobs initially undertaken in mid-late careers, females' discontinuous jobs (20% of all jobs) have almost triple the transition rates of normal jobs. Given females' average 5.62 years of work before marriage, their withdrawal in later careers may be correlated with episodes in the family cycle, such as maternity leave (Chang 2006; Chien and Hsueh 1996). In brief, while males withdraw from the labor market less, they pay the price for temporary discontinuity if they do leave throughout their careers. For females, only exits

in mid-late careers have serious effects, while working on and off during early careers is common and does not have effects on their career mobility.[70]

Two important life events, getting married and having the first child, have gender-specific effects on transition rates of job mobility. First birth has strong impacts on females' employment throughout careers, but does not affect males' at all. Conversely, getting married stabilizes males' careers, but has no impact on females'. Interestingly, for men with careers interrupted by CMS, first marriage fosters the pace of job change before CMS by increasing exit rates by 94%, but leads to more settled careers after CMS by decreasing exit rates by 42%, while controlling for all sets of covariates.

With regard to gender differences in the effects of human capital and job history, two findings stand out. Most importantly, given the fact that the same proportions of men and women ever complete further education, only men benefit from additional investment in human capital after schooling, regardless of whether their careers are interrupted by CMS. Additional education exerts a positive influence on job transitions in careers after CMS for males with careers interrupted by CMS; and for males with continuous careers, its effect is immediately evident during their early careers. Second, job history, such as firm-specific labor force experience, has negative effects for females only in mid-late careers, but for males with continuous careers, it displays the effect at the beginning of their careers. This implies that the time gap between job history accumulated and its effects on subsequent mobility is longer for females than for males. In other words, males accumulate labor force experience more easily and rapidly than females.

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[70] Yu (2006) studies Taiwanese and Japanese females' discontinuous jobs and their rates of return to labor work. The research finds that in comparison, women in Taiwan tend to quit for their own reasons, but not necessarily for family reasons. Hence, I consider that Taiwanese women's early leave from the labor market may be associated with other personal reasons, such as completing further education and traveling, that differ from family reasons.

According to these findings, there are two explanations of gender differences: structure-ascribed and individual-ascribed. For the structural aspect, the effects of further education only for males may imply that the reward system in Taiwan's labor market is more efficient for males than for females. In other words, there may be gender inequality in the labor market, by which females fail to receive corresponding rewards to those of males through job mobility when their human capital is enhanced. From the vantage point of individuals, this may result from females' high percentage of discontinuous jobs. Since females are more likely to take a leave than males, withdrawal from the labor market blocks the potential connection between human capital and its corresponding rewards. Although males have stronger effects from job mobility induced by discontinuous jobs than females, if that is the case, losing these effects could be one of the costs for females' temporary leaves from the labor market. In the following chapters, I will further investigate the structural influences on gender differences in job mobility.

To sum up, the analyses in this chapter demonstrate the dynamics of career mobility by specifying two career stages and primarily exploring the difference in career development between males who take CMS before or those who take it after their careers begin. All findings in this chapter lead to the conclusion that the time dependence of job mobility is deeply embedded in the context of life course in a society. For Taiwanese men, the timing of taking CMS (i.e., before or after their first entry into the labor force) is crucial to the pace and type of job change. For Taiwanese women, the contrast of job mobility among career stages is distinct, and temporary leaves from the labor market during their early careers are common and have minor effects on subsequent mobility. For both genders, early careers are characterized by fast job changes and vulnerability to labor-market structure. In mid-late careers, however, people enter into a stable stage, in which work experience and job history are accumulated and appreciated.

# Chapter 5: Class Mobility throughout Careers

In the last chapter, I discussed the time-dependence of job mobility by examining trajectories and patterns of job change for Taiwanese people. This chapter further investigates the time-dependence of class mobility and the interactions between job change and class moves throughout careers. Using two measures of class--prestige scores and the class scheme revised from Wright et al. (1982)--I identify patterns of class mobility with different directions and mechanisms of critical moves between social classes with significant change in property possession, authority, autonomy, or work content. Section 5.1 analyzes patterns of upward, lateral, and downward mobility and examines whether proportions of class moves, including upward and downward directions, change with time spent in careers. Using the class scheme to define social classes, Section 5.2 investigates the relations among job and class episodes, class departure and entry throughout careers, and mechanisms of four kinds of critical moves: entry into self-employed/employers, from fundamental employees to managers, from non-professional to professional employees, and mobility between white-collar and blue-collar workers.

## 5.1 Upward, Lateral, and Downward Mobility

### 5.1.1 Descriptive Statistics

Using the Taiwan occupational prestige scale (Hwang 2003) to measure status, Table 5.1 lists average prestige scores of all jobs, first jobs, and current jobs for Taiwanese people. We find that, on average, an individual stays in jobs with about the same level of prestige, with small differences between first and current jobs. Since the reputation of an occupation is strongly associated with its educational qualification in Taiwan, males who start their careers after fulfilling CMS enjoy the highest level of

prestige, followed by females, who have the next-highest level; those with careers interrupted by CMS have the lowest occupational prestige throughout their careers.

Table 5.1 Mean Prestige Score for All Jobs, First Jobs, and Current Jobs

| | Mean Prestige Score | | |
|---|---|---|---|
| | All jobs | First jobs | Current jobs |
| Total Population | 73.19(4.41) | 73.09(4.46) | 73.63(4.75) |
| People with continuous careers | 73.60(6.10) | 73.77(4.67) | 74.10(4.95) |
| Females | 72.85(5.85) | 72.93(4.28) | 73.29(4.56) |
| Males | 75.37(6.30) | 75.59(4.96) | 75.85(5.29) |
| People with careers interrupted by CMS | 71.97(4.24) | 71.46(3.40) | 72.53(4.06) |

Note: Standard deviations are in parentheses. For the Taiwan occupational prestige scale (Hwang 2003), range = 26.2, average = 74.85, standard deviation = 6.59, Min = 63.6, Max = 89.8.

Table 5.2 Correlation of Occupational Prestige between First Job and Current Job

| Pearson Correlation between first job vs. current job | |
|---|---|
| Total Population | .6718 |
| People with continuous careers | .7266 |
| Females | .6904 |
| Males | .7377 |
| People with careers interrupted by CMS | .4184 |
| First job after CMS vs. current job | .6445 |
| First job before CMS vs. first job after CMS | .5425 |

In terms of correlation between first and current statuses, Table 5.2 shows that people with continuous careers usually have a high degree of correlation in status (i.e., Pearson's $\gamma$ is about 0.7), and within this group, females have a correlation coefficient slightly lower than males. People with careers interrupted by CMS, however, have a status correlation between first and current jobs that is quite low ($\gamma = 0.4184$), but the correlation coefficient between first job after CMS and current job is close to the average correlations for other people ($\gamma = 0.6445$). Given a median correlation between first jobs before and after CMS, the statistics in this table imply that status attainments in careers

before and after CMS are distinct from each other and that trajectories of class mobility in each stage may diverge as well.

To examine occurrence of class transitions changing with time spent in careers, I calculate the frequencies of class moves occurring during first five years and after five years in careers and graph the percentages in histograms in Figures 5.1 and 5.2. Upward mobility is defined as a job change with an increase in prestige scores of more than three points and downward mobility as one dropping more than three points of prestige; other job changes are defined as lateral shifts. Note that discontinuous jobs are excluded in the analysis of job change with directions, because they have no subsequent attainments with which to construct a class move.

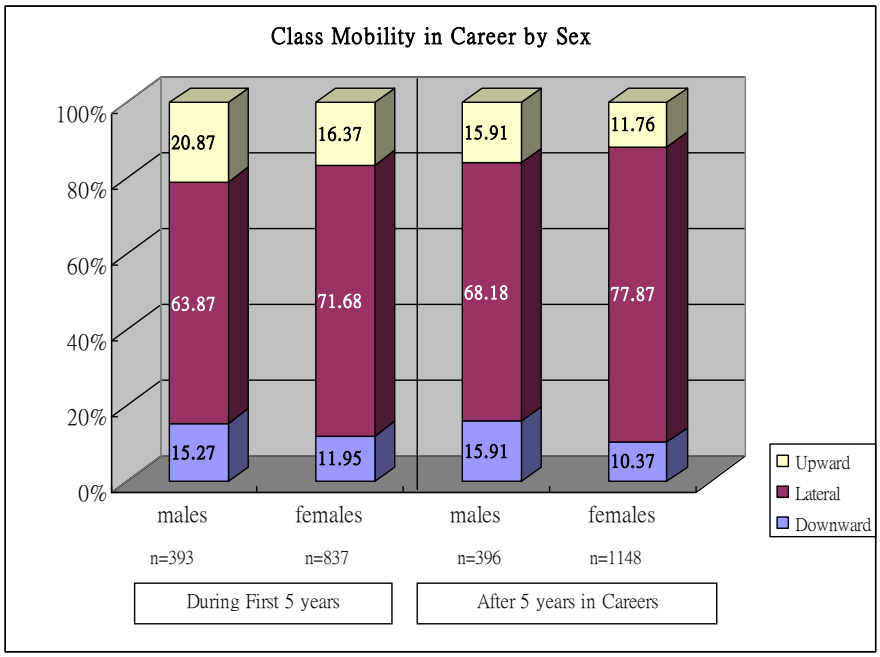


Figure 5.1 Percentages of Upward, Lateral and Downward Mobility for People with Continuous Careers

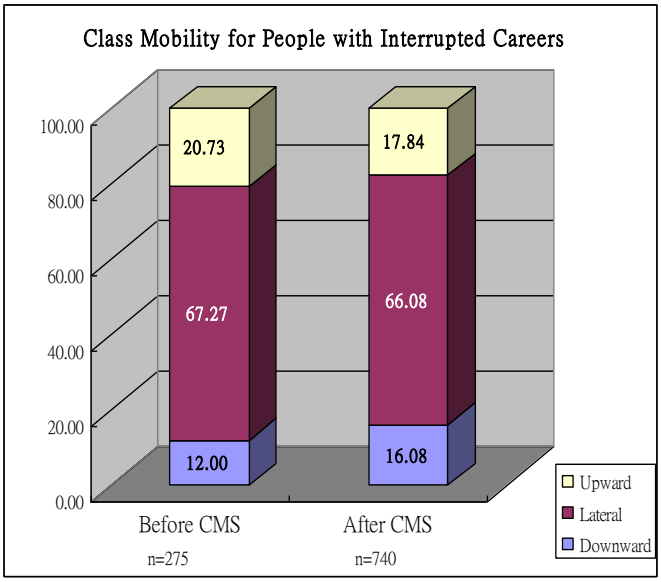


Figure 5.2 Percentages of Upward, Lateral, and Downward Mobility for People with Continuous Careers

Individuals with continuous careers have an obvious and consistent tendency of class mobility. More class moves take place in early years than in later careers. Upward mobility has a higher proportion in the beginning than in later careers, lateral shifts have a contrary tendency, and downward mobility continues at relatively equal percentages throughout careers. For people with careers interrupted by CMS, the ratio of class change (including upward and downward directions) versus lateral shifts before and after CMS is approximately equal, but 20.73% of job changes before CMS are upwardly mobile, and this proportion is even higher than that in careers after discharging from the military.

### 5.1.2 Upward, Lateral, and Downward Mobility among Career Stages

Using the definitions of career stages set in Chapter Four (i.e., early and mid-late stages referring to jobs initially held within the first five years and after five years in careers, respectively), Figure 5.3 plots transition rates estimated by piecewise constant exponential models with the time axis split in two-year intervals for people with

continuous careers. Lateral mobility has a higher level of transition rates than other job shifts ending with a salient change in occupational prestige in both stages. Compared to mobility in early careers, transition rates of lateral shifts in Graph (B) decrease sharply in mid-late careers, but only a slight decrease in pace of upward and downward mobility occurs during this period.

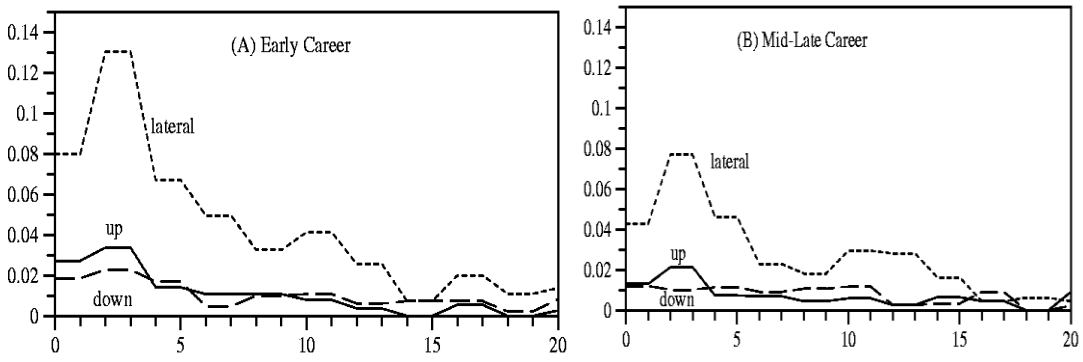


Figure 5.3 Upward, Lateral, and Downward Mobility among Career Stages for People with Continuous Careers (Piecewise, Constant Exponential Rates in 2-Year Intervals)

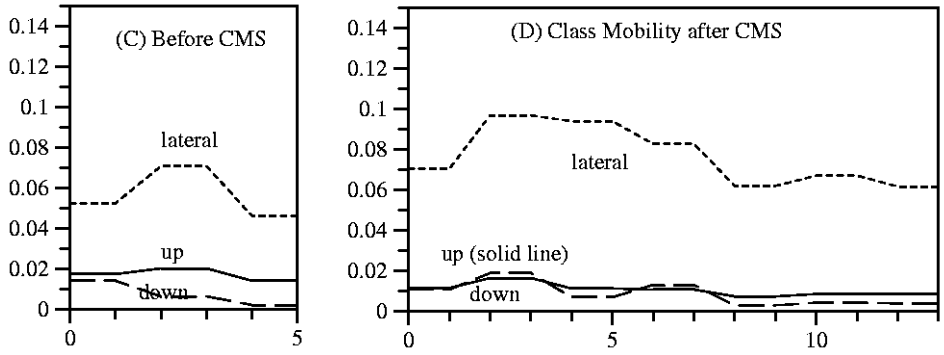


Figure 5.4 Upward, Lateral, and Downward Mobility in Careers before and after CMS for People with Careers Interrupted by CMS (Piecewise, Constant Exponential Rates in 2-Year Intervals)

Excluding the last jobs before engaging in CMS, Figure 5.4 displays trajectories of directional moves occurring before and after CMS for people with careers interrupted by CMS. Basically, the disposition of trajectories for these three kinds of mobility is similar between careers before and after CMS except for different levels of rates for lateral shifts. Given the finding of fast job changes taking place before CMS in the last chapter, we find that lateral shifts in careers after CMS actually transition faster than their counterparts occurring before CMS, once we specify the directions of job mobility using status prestige. For class moves, upward mobility before CMS has slightly higher rates than those after CMS, and downward moves have a contrary tendency. These changes in rates among career periods correspond to the change in percentages of upward and downward mobility demonstrated in Figures 5.1 and 5.2, which relatively speaking, there are more upward-moves and fewer downward moves occurring in early careers than in later ones.

***Mechanisms of Upward, Lateral, and Downward Mobility***

The analyses of job mobility among career stages in Chapter Four do not take directions of job change into account, and the effects of covariates may be offset by contrasting directions of mobility. Specifying three types of mobility, upward, lateral, and downward mobility, this section explores their patterns among career stages via Cox models. Table 5.3 presents estimates of covariates for all job changes for people with continuous careers.

Table 5.3 Upward, Lateral, and Downward Mobility for People with Continuous Careers (Cox Models)

| | Upward | Lateral | Downward |
|---|---|---|---|
| Cohort 2 (35-44 years old in 1996) | -0.02 (0.98) | 0.02 (1.02) | 0.14 (1.15) |
| Cohort 3 (25-34 years old in 1996) | -0.10 (0.91) | 0.18 (1.19) | 0.23 (1.26) |
| Educational cohort | -0.23 (0.90) | 0.15 (1.16) | -0.09 (0.91) |
| Father's occupation: Owners | -0.04 (0.96) | -0.07 (0.93) | 0.51 (1.67)** |
| White-collar workers | 0.39 (1.48)** | 0.05 (1.05) | 0.34 (1.40) |
| Blue-collar workers | 0.14 (1.15) | 0.09 (1.09) | 0.49 (1.64)* |
| Ethnicity: Mainlanders | -0.02 (0.98) | 0.19 (1.21)** | 0.16 (1.18) |
| Sex | 0.09 (1.10) | -0.32 (0.72)*** | 0.12 (1.13) |
| **Covariates of Human Capital** | | | |
| Education (school year) | 0.15 (1.16)*** | -0.01 (0.99) | -0.05 (0.95)* |
| College | 0.27 (1.31) | 0.18 (1.20)* | -0.86 (0.42)*** |
| Further education | 0.45 (1.57)* | -0.04 (0.96) | 0.05 (1.05) |
| **Job History Covariates** | | | |
| General labor force experience | -0.02 (0.98) | -0.00 (1.00) | -0.03 (0.97) |
| Firm-specific labor force experience | -0.12 (0.89)*** | -0.05 (0.95)*** | -0.10 (0.90)** |
| Number of previous job | 0.04 (1.04) | 0.10 (1.11)*** | -0.00 (1.00) |
| Previous class (Prestige) | -0.30 (0.74)*** | -0.03 (0.97)*** | 0.21 (1.23)*** |
| First class (Prestige) | 0.02 (1.02) | 0.01 (1.01) | -0.06 (0.94)*** |
| **Life Event Covariates** | | | |
| Married | -0.52 (0.60)* | -0.23 (0.80)* | -0.30 (0.74) |
| Parenthood | -0.32 (0.73) | -0.43 (0.65)*** | -0.29 (0.75) |
| **Labor Market Conditions** | | | |
| CE1: Industrialization | 0.33 (1.39) | 0.32 (1.37)* | 0.04 (1.04) |
| CE2: Economic cycle | -0.04 (0.97) | -0.06 (0.94)* | 0.03 (1.03) |
| Number of events | 417 | 2015 | 342 |
| Log likelihood (final estimates) | | -17675.7439 | |
| Likelihood-ratio statistics (Model $\chi^2$) | | 2016.93*** | |
| Degrees of freedom | | 20 | |

Note: * Statistically significant at 0.05 level, ** at 0.01 level, *** at 0.001 level. The relative risk ratio is in parentheses.

First of all, there is no gender difference in transition rates of directional moves (either upward or downward mobility), and for lateral shifts, males have transition rates 28% lower than females'. Higher education fosters upward mobility but suppresses downward moves. Having a college degree displays stronger negative effects on downward mobility than does education, which lowers transition rates 58% compared to a 5% decrease for every one year of schooling on downward mobility. Importantly, further education after schooling shows the strongest positive effects on upward mobility

of all the covariates of human capital. For the influences of first and previous statuses, except for downward mobility, effects of first class become insignificant after including previous status in the models. With respect to life events, marriage has negative effects on upward and lateral moves, and entry into parenthood is associated with only lateral mobility. Transition rates for the three kinds of mobility all decrease by duration of job holding. In addition, only lateral mobility is affected by number of previous jobs and cohort effects of labor-market conditions.

Table 5.4 Upward, Lateral, and Downward Mobility for People with Continuous Careers (Cox Models)

| | Early Career | | | Mid-Late Career | | |
|---|---|---|---|---|---|---|
| | **Upward** | **Lateral** | **Downward** | **Upward** | **Lateral** | **Downward** |
| Cohort 2 (35-44 years old in 1996) | -0.63 (0.53) | -0.02 (0.98) | -0.10 (0.91) | 0.16(1.18) | 0.03(1.03) | 0.51(1.66) |
| Cohort 3 (25-34 years old in 1996) | -0.76 (0.47) | 0.42 (1.52)* | -0.09 (0.91) | 0.72(2.06) | 0.09(1.09) | 0.99(2.70) |
| Educational cohort | -0.06 (0.94) | 0.20 (1.22) | -0.30 (0.74) | 0.15(1.17) | 0.17(1.18) | 0.05(1.06) |
| Father's occupation: Owners | -0.20 (0.82) | -0.05 (0.95) | 0.39 (1.47) | 0.10(1.10) | -0.05(0.96) | -0.06(0.94) |
| White-collar workers | -0.10 (0.90) | 0.11 (1.11) | 0.23 (1.26) | 0.86(2.37)* | 0.06(1.06) | 0.36(1.44) |
| Blue-collar workers | -0.32 (0.73) | 0.17 (1.18) | 0.34 (1.41) | 0.74(2.10) | 0.09(1.09) | 0.15(1.16) |
| Ethnicity: Mainlanders | -0.02 (0.98) | 0.08 (1.09) | 0.08 (1.08) | 0.26(1.30) | 0.14(1.15) | 0.12(1.13) |
| Sex | -0.12 (0.88) | -0.38 (0.69)*** | -0.18 (0.83) | 0.24(1.28) | -0.18(0.83) | 0.16(1.17) |
| **Covariates of Human Capital** | | | | | | |
| Education (school year) | 0.12 (1.13)*** | 0.00(1.00) | -0.04(0.96) | 0.17(1.19)*** | -0.02(0.98) | -0.07(0.94) |
| College | 0.60(1.83)* | 0.02(1.02) | -0.67(0.51)* | -0.14(0.87) | 0.11(1.12) | -1.16(0.31)** |
| Further education | 0.61(1.85) | 0.07(1.07) | -0.18(0.83) | 0.37(1.45) | -0.13(0.88) | 0.16(1.17) |
| **Job History Covariates** | | | | | | |
| General labor force experience | 0.03(1.03) | 0.03(1.03) | -0.27(0.77) | -0.02(0.98) | -0.01(0.99) | -0.01(0.99) |
| Firm-specific labor force experience | -0.09(0.91) | 0.01(1.01) | -0.16(0.86) | -0.09(0.91) | -0.06(0.94) | -0.07(0.93) |
| Number of previous job | 0.09(1.09) | 0.15(1.16)* | -0.09(0.92) | -0.02(0.98) | 0.14(1.15)*** | -0.01(0.99) |
| Previous class (Prestige) | -0.29(0.75)*** | -0.02(0.98) | 0.19(1.21)*** | -0.28(0.76)*** | -0.02(0.98) | 0.19(1.21)*** |
| First class (Prestige) | 0.04(1.04) | 0.02(1.02) | -0.03(0.97) | 0.03(1.03) | 0.02(1.02) | -0.06(0.94) |
| **Life Event Covariates** | | | | | | |
| Married | -0.21(0.81) | -0.04(0.96) | -0.53(0.59) | -0.55(0.58) | -0.15(0.86) | -0.22(0.80) |
| Parenthood | -0.65(0.52) | -0.61(0.54)** | 0.18(1.20) | -0.15(0.86) | -0.43(0.65)* | -0.82(0.44) |
| **Labor Market Conditions** | | | | | | |
| CE1: Industrialization | 1.32(3.76) | 0.94(2.56)** | -0.14(0.87) | -0.85(0.43) | 0.12(1.12) | -0.52(0.60) |
| CE2: Economic cycle | -0.00(1.00) | -0.14(0.87)** | -0.10(0.90) | -0.08(0.93) | -0.05(0.96) | 0.02(1.02) |
| Number of events | 128 | 517 | 92 | 101 | 573 | 90 |
| Log likelihood (final estimates) | | -3942.8962 | | | -4357.2745 | |
| Likelihood-ratio statistics (Model $\chi^2$) | | 614.67*** | | | 446.11*** | |
| Degrees of freedom | 20 | 20 | 20 | 20 | 20 | 20 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses.

Table 5.5 Upward, Lateral, and Downward Mobility by Genders for People with Continuous Careers (Cox Models)

| | Females | | | Males | | |
|---|---|---|---|---|---|---|
| | **Upward** | **Lateral** | **Downward** | **Upward** | **Lateral** | **Downward** |
| Cohort 2 (35-44 years old in 1996) | 0.05(1.05) | -0.03(0.97) | -0.14(0.87) | -0.02(0.98) | 0.14(1.15) | 0.59(1.81) |
| Cohort 3 (25-34 years old in 1996) | 0.13(1.13) | 0.18(1.19) | -0.40(0.67) | -0.23(0.80) | 0.16(1.18) | 1.26(3.52)* |
| Educational cohort | 0.02(1.02) | 0.18(1.20) | 0.07(1.08) | -0.42(0.66) | 0.09(1.10) | -0.36(0.70) |
| Father's occupation: Owners | -0.23(0.80) | -0.09(0.91) | 0.49(1.64)* | 0.19(1.21) | -0.13(0.88) | 0.56(1.76) |
| White-collar workers | 0.23(1.26) | 0.01(1.01) | 0.49(1.63)* | 0.67(1.96)* | 0.11(1.12) | 0.18(1.20) |
| Blue-collar workers | -0.13(0.88) | 0.06(1.06) | 0.63(1.88)* | 0.56(1.75) | 0.12(1.13) | 0.28(1.32) |
| Ethnicity: Mainlanders | 0.16(1.18) | 0.07(1.07) | 0.08(1.09) | -0.20(0.82) | 0.41(1.51)*** | 0.30(1.34) |
| **Covariates of Human Capital** | | | | | | |
| Education (school year) | 0.12(1.13)*** | 0.00(1.00) | -0.06(0.95) | 0.19(1.21)*** | -0.06(0.95)** | -0.05(0.95) |
| College | 0.12(1.13) | -0.04(0.96) | -1.26(0.28)*** | 0.34(1.41) | 0.66(1.94)*** | -0.46(0.63) |
| Further education | 0.38(1.46) | -0.13(0.88) | 0.10(1.10) | 0.51(1.66) | 0.02(1.02) | 0.14(1.16) |
| **Job History Covariates** | | | | | | |
| General labor force experience | -0.01(0.99) | 0.00(1.00) | -0.06(0.94) | 0.03(1.03) | 0.01(1.01) | -0.04(0.96) |
| Firm-specific labor force experience | -0.09(0.91)* | -0.03(0.97)* | -0.14(0.87)** | -0.12(0.89) | -0.06(0.94)* | -0.09(0.91) |
| Number of previous job | 0.03(1.03) | 0.08(1.08)* | -0.04(0.96) | 0.01(1.01) | 0.11(1.12)* | 0.04(1.04) |
| Previous class (Prestige) | -0.33(0.72)*** | -0.03(0.97)** | 0.24(1.27)*** | -0.28(0.76)*** | -0.04(0.96)* | 0.18(1.19)*** |
| First class (Prestige) | 0.04(1.04) | 0.01(1.01) | -0.06(0.94)** | -0.01(0.99) | 0.02(1.02) | -0.06(0.94)* |
| **Life Event Covariates** | | | | | | |
| Married | -0.27(0.76) | -0.14(0.87) | -0.01(0.99) | -1.21(0.30)** | -0.36(0.70)* | -0.76(0.47) |
| Parenthood | -0.76(0.47)** | -0.62(0.54)*** | -0.70(0.50)* | 0.56(1.75) | -0.08(0.93) | 0.33(1.40) |
| **Labor Market Conditions** | | | | | | |
| CE1: Industrialization | 0.32(1.38) | 0.30(1.35) | -0.32(0.73) | 0.76(2.15) | 0.48(1.62) | -0.01(0.99) |
| CE2: Economic cycle | 0.00(1.00) | -0.04(0.96) | 0.06(1.06) | -0.11(0.90) | -0.11(0.89)** | 0.00(1.00) |
| Number of events | 272 | 1494 | 219 | 145 | 521 | 123 |
| Log likelihood (final estimates) | | -11807.8051 | | | -4197.4558 | |
| Likelihood-ratio statistics (Model $\chi^2$) | | 1286.19*** | | | 759.19*** | |
| Degrees of freedom | 19 | 19 | 19 | 19 | 19 | 19 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses.

Cox models in Table 5.4 further specify mobility happening in early and mid-late careers. Because the estimation of parameters in hazard models is sensitive to the number of events, and the number of job episodes in early careers is much more than that in the mid-late stage, I employ a standardization of event frequencies, in which the number of episodes ending with an event (i.e., upward, lateral downward moves) in mid-late careers serves as the baseline, and using the technique of random selection, number of episodes in early careers is standardized to approximate the baseline (see detailed demonstration in Blossfeld and Rohwer 2002:107-109). Basically, the mechanisms of upward, lateral, and downward mobility between these two stages are similar, except that the cohort effects of labor-market conditions work only on lateral shifts in early careers. In addition, the effects of further education, marriage, and firm-specific labor force experience lose significance after career stages are specified.[71]

Given no difference in mobility patterns among career stages, models in Table 5.5 separate genders and indicate that effects of life events on class mobility are gender-specific in a manner similar to that of job change found in the last chapter. The negative effect of marriage showed in the total model in Table 5.3 actually takes place on males' upward and downward mobility, and entering into parenthood suppresses all three kinds of mobility only for females.

For people with careers interrupted by CMS, the episodes ending with three kinds of mobility in careers before CMS are too few to make appropriate estimations in Cox models, because the last jobs people have before engaging in CMS do not cause any upward, lateral, or downward mobility. Therefore, Table 5.6 presents only the patterns of mobility occurring after people discharge from CMS. We find that mechanisms of these

[71] The disappearance of further education effects results from the interactions between gender differences and the time-dependence of job mobility. A Cox model (which is not shown here) reveals that the positive effect of further education actually works on males' early mobility. In addition, because early-career episodes are randomly selected to reach the approximately same size of episodes in mid-late careers, the model of early careers does not use the total information, thus reducing the model's explanatory power.

three kinds of mobility are similar to those for people with continuous careers except for cohort effects of labor-market condition, which do not have any effects on lateral mobility for this group of people.[72]

Table 5.6 Upward, Lateral, and Downward Mobility in Careers after CMS for People with Careers Interrupted by CMS (Cox Models)

| | Upward | Lateral | Downward |
|---|---|---|---|
| Cohort 2 (35-44 years old in 1996) | -0.13(0.88) | -0.16(0.85) | 0.04(1.04) |
| Cohort 3 (25-34 years old in 1996) | 0.53(1.71) | -0.45(0.64) | 0.86(2.37) |
| Educational cohort | -0.77(0.46) | 0.10(1.11) | 0.39(1.48) |
| Father's occupation: Owners | 0.11(1.12) | -0.28(0.75)* | -0.03(0.97) |
| White-collar workers | 0.67(1.93)* | 0.15(1.16) | 0.18(1.20) |
| Blue-collar workers | 0.33(1.39) | 0.05(1.05) | 0.13(1.14) |
| Ethnicity: Mainlanders | -0.60(0.55) | 0.12(1.12) | 0.20(1.22) |
| **Covariates of Human Capital** | | | |
| Education (school year) | 0.19(1.21)*** | -0.00(1.00) | -0.11(0.90)* |
| College | 1.14(3.13)** | 0.13(1.14) | -0.95(0.39)* |
| Further education | -1.53(0.22) | 0.47(1.60)* | 0.39(1.48) |
| **Job History Covariates** | | | |
| General labor force experience | -0.12(0.88) | -0.00(1.00) | 0.01(1.01) |
| Firm-specific labor force experience | -0.11(0.90) | -0.05(0.95) | -0.01(0.99) |
| Number of previous job | 0.07(1.07) | 0.18(1.20)** | -0.19(0.83) |
| Previous class (Prestige) | -0.35(0.71)*** | -0.02(0.98) | 0.23(1.26)** |
| First class (Prestige) | 0.04(1.04) | -0.00(1.00) | -0.04(0.96) |
| **Life Event Covariates** | | | |
| Married | -0.31(0.73) | -0.54(0.58)** | -0.42(0.66) |
| Parenthood | -0.43(0.65) | 0.10(1.11) | -0.11(0.90) |
| **Labor Market Conditions** | | | |
| CE1: Industrialization | -0.78(0.46) | 0.52(1.68) | 0.28(1.32) |
| CE2: Economic cycle | 0.03(1.03) | -0.09(0.92) | -0.08(0.92) |
| Number of events | 132 | 489 | 119 |
| Log likelihood (final estimates) | | -4265.9853 | |
| Likelihood-ratio statistics (Model $\chi^2$) | | 560.51*** | |
| Degrees of freedom | | 19 | |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses.

[72] The covariates in the model of careers after CMS use only the information in careers after CMS, and the cohort effects of labor-market conditions at the time of re-entering the labor market from the military show no significance on any kind of mobility. If we contain the cohort effects at the time of first entry into the labor force in the model of careers after CMS, however, they become significant, as the finding showed in Section 4.3.

### 5.1.3 Summary

In last chapter, I concluded that job mobility is time-dependent in terms of decreasing levels of transition rates as well as divergent mechanisms throughout careers. Upon specifying the directions of job change and excluding the interference caused by discontinuous jobs, however, I find that only lateral shifts have different patterns of transition in different career stages, and both upward and downward mobility run in a consistent way throughout careers.

Using ±3 points of prestige score as a cutoff to define the directions of job change, results show that for people with continuous careers, percentages of class moves decrease and the percentage of lateral shifts increases by time spent in careers. For those with careers interrupted by CMS, it is found that their lateral shifts occur in approximately equal proportions in either period before and after CMS and it is relatively easier for them to move upward on their occupational status in careers before CMS than after reentering the labor force from the military.

For all Taiwanese people, there is no significant gender difference in transition rates for upward and downward mobility after controlling for the full set of covariates. Job shifts ending with salient change in occupational prestige are affected only by the individual's human capital, previous status, and important life events. High education and college degree have double-sided effects, by which they increase rates of upward moves and slow down the pace of downward mobility. Having a college degree, in particular, protects people from downward movement. For the influences of life events on class moves, marriage is associated specifically with males, decreasing their likelihood of upward and lateral mobility. In contrast, having the first child impedes all kinds of mobility for females. These patterns do not change among different career stages.

Apropos of lateral shifts, females have higher transition rates than males, and mobility in early careers is more sensitive to external conditions in the labor market than mobility in later careers.

Using prestige to define the directions of job mobility, we can detect any job shift bringing a certain range of change in one single dimension of status, whereas it cannot capture qualitative change in other aspects of employment. For example, transition to a job in the neighborhood of residence may greatly improve one's quality of life and well-being, even though it may not make much difference in prestige status. Job shifts from standard to non-standard employment, which is a main way for females to reconcile economic production and family responsibilities in Taiwan and Japan (Yu 2001a, b, 2004), may not be discerned as well if the transition is within similar levels of prestige status. Therefore, the next section analyzes class mobility between social classes defined by a class scheme revised from traditional research on social mobility to complement understandings of class mobility on aspects of qualitative change, such as employment status, levels of authority, and work autonomy.

## 5.2 JOB MOBILITY AND CLASS MOBILITY

### 5.2.1 Influence of First Class Position

#### *Class Distribution*

Table 5.7 presents the distribution of first class position for Taiwan people. Three findings in the table should be noted. First, females mainly start their careers as white-collar workers, blue-collar workers, and farmers (83.54%), and they have a quite low percentage of being self-employed or owners in their first job (4.20%), compared with 9.59% of males with continuous careers and 8.65% of males with careers interrupted by CMS. Second, 31.1% of males with continuous careers start their careers in professional

classes (including Classes III and IV), and the proportion of being managers and supervisors in the first job is highest among other people. Finally, for people with careers interrupted by CMS, 83.54% start in low-level classes (white-collar workers, blue-collar workers, and farmers), but compared with the distribution of first class after CMS, we find sharp increases in self-employed and owners (the joint percentage is close to 20%), professional classes (7.54%), and managers/supervisors (6.48%). In other words, although careers before CMS take place in a short period with fast transition rates of job change, the first attainments after CMS are much different.

Table 5.7 Distribution of First Class Position for Taiwanese People

| Class | People with Interrupted Careers | | People with Continuous Careers | | Total population |
|---|---|---|---|---|---|
| | First class | First class after CMS | Females | Males | |
| I. Owners | 2.76 | 7.41 | 0.97 | 2.91 | 1.94 |
| II. Self-employed | 5.91 | 12.43 | 3.33 | 6.68 | 4.85 |
| III. Professionals | 1.31 | 1.46 | 5.69 | 8.22 | 4.97 |
| IV. Associate professionals | 3.81 | 6.08 | 8.85 | 22.95 | 10.55 |
| V. Managers/supervisors | 2.23 | 6.48 | 2.36 | 13.70 | 4.89 |
| VI. White-collar workers | 6.82 | 6.61 | 29.81 | 12.16 | 19.01 |
| VII. Blue-collar workers | 62.34 | 46.96 | 42.16 | 29.45 | 45.25 |
| VIII. Farmers | 14.83 | 12.57 | 6.82 | 3.94 | 8.54 |
| Percentage (frequency) | 100(756) | 100(762) | 100(1231) | 100(584) | 100(2577) |

Note: All numbers are column percentages and the total number is in the parentheses of the last row.

Table 5.8 presents the distribution of current class. Compared to first class position, we find that the percentages of Classes I and II increase for all people and that males with careers interrupted by CMS have the highest proportion running their own business (about 33%). In addition to Classes I and II, females mainly move to the classes of associate professionals and managers/supervisors. For males with continuous careers, their percentages of professional classes (Class III and IV) decrease, but proportions

increase in owners, self-employed, and managers/supervisors, compared to their distribution of first class.

Table 5.8 Distribution of Current Class for Taiwanese People

| Class | People with Interrupted Careers | People with Continuous Careers | | Total population |
|---|---|---|---|---|
| | | Females | Males | |
| I. Owners | 13.12 | 4.23 | 12.01 | 8.62 |
| II. Self-employed | 19.82 | 9.52 | 11.66 | 13.05 |
| III. Professionals | 1.31 | 5.13 | 7.20 | 4.47 |
| IV. Associate professionals | 3.41 | 9.44 | 16.98 | 9.36 |
| V. Managers /supervisors | 7.35 | 6.51 | 17.67 | 9.29 |
| VI. White-collar workers | 5.91 | 28.23 | 9.43 | 17.37 |
| VII. Blue-collar workers | 38.32 | 32.47 | 20.58 | 31.51 |
| VIII. Farmers | 10.24 | 4.48 | 4.46 | 6.18 |
| Percentage (total number) | 100(762) | 100(1230) | 100(583) | 100(2574) |

***Effects of First Class on Job Mobility***

To explore whether the first class from which one departs affects speeds of job transitions, models in Table 5.9 contain seven covariates of first class. All job shifts are examined for females and males with continuous careers. For males with careers interrupted by CMS, two models (in the last two columns), respectively, contain first classes at time of first entry and of re-entering entry the labor force from the military. To avoid a biased estimation on transition rates resulting from extremely rapid mobility before CMS, only job changes after CMS are investigated.

Table 5.9 Effects of First Class on Job Mobility (Exponential Rate Models)

| | Females | Males with continuous careers | Males with interrupted careers | |
|---|---|---|---|---|
| | | | First class | First class after CMS |
| Constant | -2.20 (0.11)*** | -2.84(0.06)*** | -2.15(0.12)*** | -2.28(0.10)*** |
| Discontinuous Jobs | 0.35 (1.41)*** | 0.76(2.13)*** | 0.92(2.51)*** | 0.89(2.43)*** |
| Cohort 2 (35-44 years old in 1996) | -0.06 (0.94) | 0.18(1.19) | -0.21(0.81) | -0.21(0.81) |
| Cohort 3 (25-34 years old in 1996) | -0.02 (0.98) | 0.32(1.37) | -0.16(0.85) | -0.23(0.79) |
| Educational cohort | 0.14(1.15) | -0.01(0.99) | -0.03(0.97) | -0.03(0.97) |
| Father's occupation: Owners | -0.02(0.98) | 0.15(1.16) | -0.16(0.85) | -0.09(0.91) |
| White-collar workers | 0.05(1.05) | 0.19(1.21) | 0.16(1.17) | 0.23(1.26)* |
| Blue-collar workers | 0.06(1.06) | 0.17(1.18) | 0.07(1.07) | 0.12(1.13) |
| Ethnicity: Mainlanders | 0.05(1.05) | 0.27(1.31)** | 0.05(1.05) | 0.08(1.08) |
| **Covariates of Human Capital** | | | | |
| Education (school year) | 0.01(1.01) | -0.01(0.99) | 0.01(1.01) | 0.00(1.00) |
| College | -0.12(0.89) | 0.22(1.24)* | 0.12(1.13) | 0.06(1.06) |
| Further education | -0.07(0.93) | 0.13(1.13) | 0.33(1.39) | 0.39(1.48)* |
| **Job History Covariates** | | | | |
| General labor force experience | 0.01(1.01) | 0.00(1.00) | -0.03(0.97) | -0.04(0.97) |
| Firm-specific labor force experience | -0.03(0.97)** | -0.08(0.93)*** | -0.08(0.92)*** | -0.08(0.92)*** |
| Number of previous job | 0.06(1.06)* | 0.05(1.05) | 0.11(1.11) | 0.07(1.07) |
| **First Class** (Class VIII as reference) | | | | |
| Class I: employer | -0.22(0.80) | 0.54(1.71) | -1.11(0.33)** | -0.82(0.44)** |
| Class II: self-employed | 0.07(1.07) | 0.27(1.31) | -0.12(0.89) | -0.08(0.92) |
| Class III: professional | 0.03(1.03) | 0.73(2.08)* | -0.18(0.84) | 0.30(1.35) |
| Class IV: associate professional | 0.31(1.36)* | 0.98(2.67)*** | 0.25(1.28) | 0.57(1.77)** |
| Class V: manager | -0.26(0.77) | 0.59(1.81) | -0.42(0.66) | -0.10(0.90) |
| Class VI: white-collar worker | 0.32(1.37)** | 0.68(1.98)* | 0.30(1.34) | 0.32(1.38) |
| Class VII: blue-collar worker | 0.45(1.57)*** | 0.95(2.59)*** | 0.07(1.07) | 0.30(1.35)* |
| **Life Event Covariates** | | | | |
| Married | -0.05(0.95) | -0.51(0.60)*** | -0.51(0.60)** | -0.49(0.61)** |
| Parenthood | -0.64(0.53)*** | 0.07(1.07) | 0.01(1.01) | 0.00(1.00) |
| **Labor Market Conditions** | | | | |
| CE1: Industrialization | 0.50(1.64)*** | 0.31(1.36) | 0.06(1.06) | 0.04(1.04) |
| CE2: Economic cycle | -0.03(0.97) | -0.08(0.92)* | -0.06(0.94) | -0.06(0.94) |
| Number of events | 2415 | 863 | 771 | 771 |
| Log likelihood (final estimates) | -6622.07 | -2579.263 | -2725.19 | -2709.48 |
| Likelihood-ratio statistics (Model $\chi^2$) | 1074.342*** | 610.4508*** | 393.662*** | 425.076*** |
| Degrees of freedom | 25 | 25 | 25 | 25 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses.

According to the results, people with continuous careers generally change jobs more frequently when starting their careers as associate professionals, white-collar workers, or blue-collar workers than other classes. These three classes are generally a step in the process of status attainment. Males in this group departing from these classes make the transition faster than their female counterparts. For those with careers interrupted by CMS, being an employer as the first class in either period (careers before or after CMS) decreases transition rates of subsequent job change by more than half. In addition, similar to people with continuous careers, those taking associate professional or blue-collar positions right after re-entering the labor force from the military change jobs more often than do people starting in other classes.

### 5.2.2 Social Mobility in Careers

#### *Job and Class*

Table 5.10 Frequency and Duration of Job and Class Held by Taiwan People

| | Job | | Class | |
|---|---|---|---|---|
| | Number | Duration | Number | Duration |
| Total Population | 2.82 (1.68) | 6.16 (7.23) | 1.99 (0.95) | 8.58 (8.21) |
| People with continuous careers | 2.57 (1.60) | 5.90 (7.15) | 1.72 (0.97) | 8.97 (8.56) |
| Females | 2.39 (1.52) | 5.60 (6.77) | 1.70 (0.97) | 9.00 (8.54) |
| Males | 2.97 (1.53) | 6.62 (7.91) | 1.76 (0.97) | 8.92 (8.58) |
| People with interrupted careers | 3.40 (1.73) | 6.61 (7.35) | 2.64 (0.92) | 7.96 (7.64) |
| Career before CMS | 1.38 (0.72) | 3.18 (2.43) | 1.13 (0.40) | 3.90 (2.59) |
| Career After CMS | 2.02 (1.13) | 8.60 (8.16) | 1.52 (0.79) | 11.03(8.69) |

Note: All figures contain both censored and uncensored jobs and classes throughout careers. Standard deviation is in parentheses.

Compared to jobs one has ever held in his/her career, the number of class a person experiences in his/her work life is fewer, and the duration of holding a class is longer.

Using the class scheme of this research to define a class, Table 5.10 shows the average numbers and durations of jobs and classes held by Taiwanese people. An individual has two classes and almost three jobs throughout a career, on average, and a class lasts about eight years in relation to the six-year duration of a job. Women on average hold jobs for a shorter period of time, but stay in a class longer, which indicates not only that their careers are less stable, but also that their class moves occur at slower rates than men's. People with careers interrupted by CMS generally have one more job and class than do other people, and the duration of the job and class held after CMS is longer than the average for the total population.

Table 5.11 Mean Number of Jobs per Class Episode by Timing of Occurrence in Careers

| Total population | Early careers | Mid-late careers | Average |
|---|---|---|---|
| | 1.65 | 1.74 | 1.69 |
| People with continuous careers | First 5 years | After 5 years | Average |
| Females | 2.35 | 1.74 | 1.94 |
| Males | 1.81 | 1.75 | 1.78 |
| People with interrupted careers | Before CMS | After CMS | Average |
| | 1.26 | 1.72 | 1.42 |

Aggregating numbers of job and class episodes ending at different times, I calculate how many job changes a class move consists of among career stages, on average. Table 5.11 presents the mean number of jobs a class transition occurring within first five and after five years in careers needs to sustain. Compared to an average of 1.54 jobs per class episode for German men (Carroll and Mayer 1987), Taiwanese males have an equivalent number of jobs (mean is 1.52) to generate a class change.[73] Females

[73] The class scheme used in Mayer and Carroll (1987) is different from that in this research. Carroll and Mayer use Goldthorpe's (1980) scheme, which specifies seven classes: I. higher grade professionals and managers, II. lower-grade professionals and managers, III. routine non-manual employees, IV. small proprietors including farmers, V. lower-grade technicians and supervisors of manual employees, VI. skilled manual employees, and VII. semi- or unskilled manual workers (Mayer and Carroll 1987:17).

change jobs within the same class more often than either group of males. Their early class moves have many more job transitions than those happening later in careers. Males with continuous jobs take less than two jobs to make a class change, and the ratio decreases slightly for class moves occurring after five years in careers. For people with careers interrupted by CMS, their class shifts occurring before engaging in CMS consist of a relatively small number of jobs compared to the early-career experiences of their counterparts.

***Class Departure***

According to the findings above, status attainment throughout one's career is more consistent and less mobile than job mobility in careers. I further examine how people make a class change and whether first class has a holding effect on class mobility. Since there are relatively few class moves in work lives, I group together all transitions of the population and include a dummy covariate to indicate the special group of people with careers interrupted by CMS in the models.[74] The estimates of Model A in Table 5.12 show that Taiwanese people do not hold the first class position longer in relation to other classes attained subsequently.

[74] For this group of people, models include only their class moves taking place after re-entry into the labor market from the military. For clarification, I use only the information about job history and labor-market conditions in careers after CMS for this group to estimate their transition rates as well. Specifically, the six covariates using only information after CMS are: general and firm-specific labor force experience, number of previous classes, first class (a dummy covariate), first status prestige, and CE1 and CE2 of labor market conditions.

Table 5.12 Transition Rates of Class Moves for the Entire Population (Cox Models)

| | **Model A** | **Model B** |
|---|---|---|
| Discontinuous Classes | 1.10(2.99)*** | 1.06(2.89)*** |
| Cohort 2 (35-44 years old in 1996) | -0.07(0.93) | -0.07(0.93) |
| Cohort 3 (25-34 years old in 1996) | -0.03(0.98) | -0.05(0.95) |
| Educational cohort | 0.04(1.04) | 0.04(1.04) |
| Father's occupation: Owners | 0.11(1.12) | 0.15(1.17)* |
| White-collar workers | 0.16(1.18)* | 0.18(1.20)** |
| Blue-collar workers | 0.16(1.18)* | 0.15(1.17)* |
| Ethnicity: Mainlanders | 0.13(1.14)* | 0.11(1.12) |
| Sex | -0.06(0.94) | 0.01(1.01) |
| People with careers interrupted by CMS | -0.20(0.82)** | -0.17(0.85)* |
| **Covariates of Human Capital** | | |
| Education (school year) | 0.03(1.03)*** | 0.04(1.04)** |
| College | -0.20(0.82)** | -0.15(0.86)* |
| Further education | 0.08(1.09) | 0.14(1.16) |
| **Job History Covariates** | | |
| General labor force experience | 0.00(1.00) | 0.01(1.01) |
| Firm-specific labor force experience | -0.02(0.98) | -0.02(0.98) |
| Number of previous class | 0.11(1.12)* | 0.16(1.18)** |
| First class (dummy covariate) | -0.12(0.89) | |
| First status (Prestige) | | -0.02(0.98)** |
| **Origin Class** (Class VIII as reference) | | |
| Class I: employer | | -0.35(0.71)* |
| Class II: self-employed | | -0.18(0.84) |
| Class III: professional | | -0.05(0.95) |
| Class IV: associate professional | | 0.52(1.69)** |
| Class V: manager | | -0.14(0.87) |
| Class VI: white-collar worker | | 0.31(1.37)** |
| Class VII: blue-collar worker | | 0.21(1.24)* |
| **Life Event Covariates** | | |
| Married | -0.28(0.76)** | -0.23(0.79)** |
| Parenthood | -0.32(0.73)*** | -0.29(0.75)** |
| **Labor Market Conditions** | | |
| CE1: Industrialization | 0.31(1.37)* | 0.30(1.35)* |
| CE2: Economic cycle | -0.03(0.97) | -0.03(0.97) |
| Number of events | 2238 | 2238 |
| Log likelihood (final estimates) | -15454.9 | -15400.2 |
| Likelihood-ratio statistics (Model $\chi^2$) | 1229.402*** | 1338.78*** |
| Degrees of freedom | 20 | 27 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses.

Excluding this covariate and adding first class prestige as well as the seven covariates of origin classes, Model B is constructed to examine whether the influences of social class on status attainment depend on the class from which an individual departs.

Outcomes reveal that people stay in Class I much longer than those in other classes. On the contrary Classes IV, VI, and VII terminate sooner than do other classes, after controlling for a full set of other covariates. As with upward and downward mobility, no gender difference is found in transition rates of class mobility. People with careers interrupted by CMS generally change classes at a slower rate than do other people. High education slightly fosters class mobility, and having a college degree has a stronger effect to keep people staying in their classes, as do entering into marriage and parenthood. In addition, social-class mobility is influenced by labor-market conditions at the time of first entry into the labor force when we do not specify what destination classes it shifts.

***Class Entry among Career Stages***

Given that Taiwanese people experience two classes on average in their work lives, I calculate the frequencies and percentages of class moves by their timing of occurrence in careers in Table 5.13.

Table 5.13 Percentage of Transitions between Social Classes by Timing of Occurrence in Careers

| Total population | Early careers | Mid-late careers | Average |
|---|---|---|---|
| | 43.20 (708) | 56.80 (931) | 100(1639) |
| People with continuous careers | First 5 years | After 5 years | Average |
| Females | 42.68 (274) | 57.32 (368) | 100 (642) |
| Males | 53.23 (214) | 46.77 (188) | 100 (402) |
| People with interrupted careers | Before CMS | After CMS | Average |
| | 36.97 (220) | 63.03 (375) | 100 (595) |

Note: Frequencies are in parentheses.

Generally, people are more likely to make class changes later in their careers than early, and the ratio of transitions occurring within the first five and after five years in careers is about 4:6, except for males with continuous careers. Having the advantage of being both male and highly educated, this group of people moves up across classes at the

very beginning of their careers. In contrast, for females and most males with careers interrupted by CMS, social-class transitions take place after CMS.

To further explore the time-dependence of status attainment for different classes, Figures 5.5 to 5.7 graph percentages of social mobility into different classes by its timing for females and two groups of males, respectively. First, for all people, attainment of Classes I and II tends to happen in later rather than early stages in careers. Males have much higher proportions (accounting for more than 40% of class moves) of being self-employed or employers than females (26.36%) after five years in careers. Females' class moves in the beginning of their careers are mainly toward Classes IV through VI (associate professionals, managers, and white-collar workers), compared to more class entries into Classes II and VII (self-employed and blue-collar employees) later in careers. This implies a tendency of polarization for females' social mobility with time spent in careers. For males with continuous careers, moves toward professional classes (Classes III and IV) occur more often in the beginning of careers, in contrast to higher proportions of entry into property owners (Classes I and II) and the managerial class (Class V) in later career stages. For males with interrupted careers, more than half of class moves occurring before CMS are toward blue-collar careers, but after re-entering the labor force from the military, having one's own business is an important means of social mobility for this group of people.

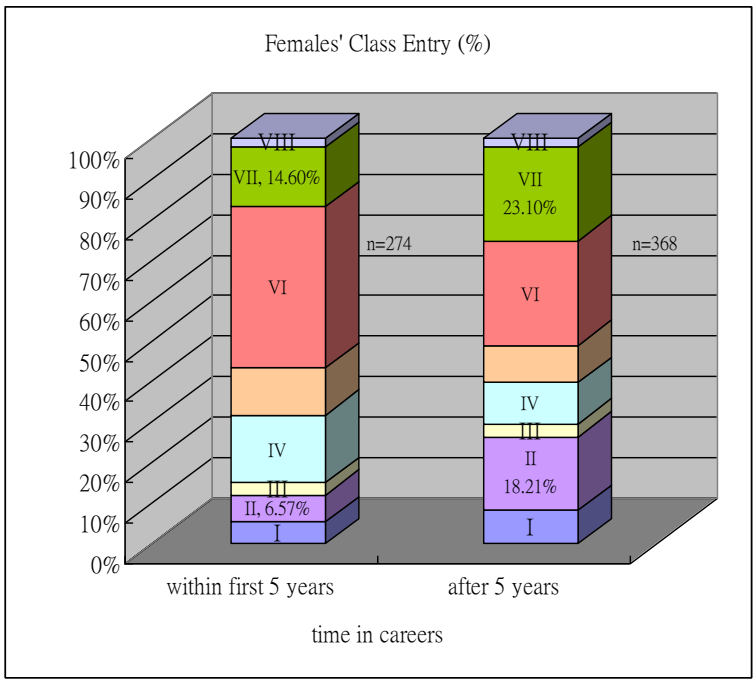


Figure 5.5 Females' Class Entry by Timing of Occurrence in Careers

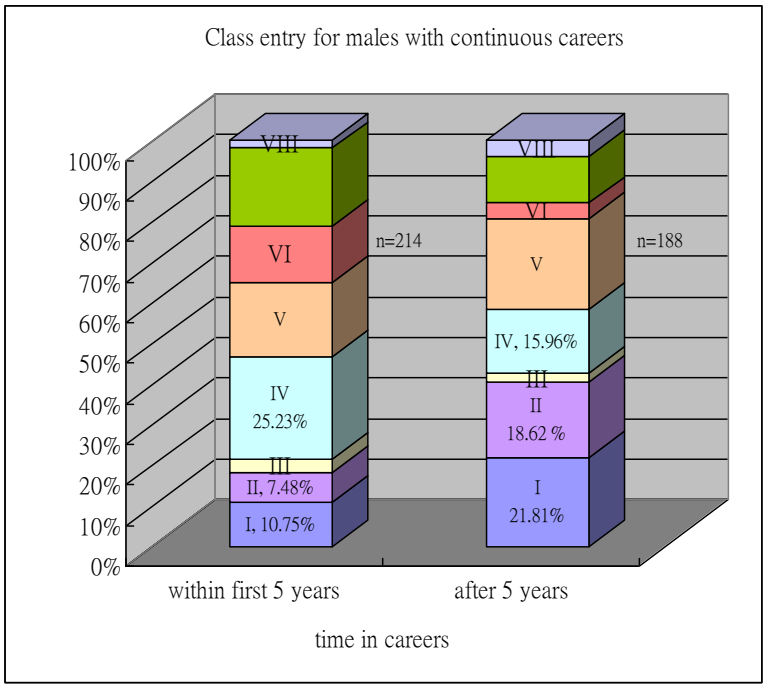


Figure 5.6 Class Entry in Careers for Males with Continuous Careers, by Timing of Occurrence in Careers

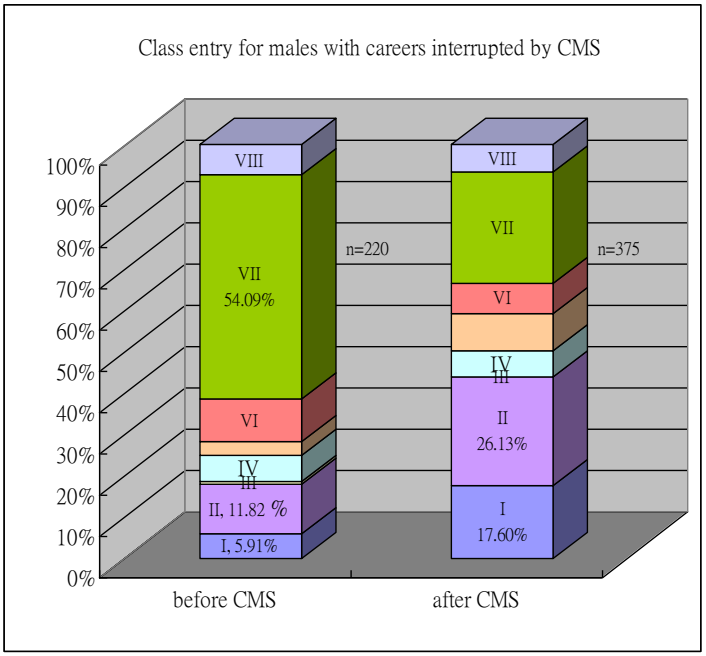


Figure 5.7 Class Entry among Careers for Males with Careers Interrupted by CMS, by Timing of Occurrence in Careers

On the whole, moves toward self-employment or employers are a mainstream method of social mobility for Taiwanese people, and it tends to happen in later rather than early careers for both genders. With respect to entry into professional classes, a higher proportion of people with continuous careers (both females and males) do this at the beginning of their careers rather than later. For managerial class entry, females tend to move in during early years, and either group of males is more likely to do it during mid-late career stages. In regard to mobility into white- or blue-collar classes, a higher proportion of females enters the white-collar class in early years, but more enter blue-collar positions later in careers, indicating a trend of downward mobility for some females. For both groups of males, percentage of entry into either white-collar or blue-collar class decreases by time spent in careers, even though people with continuous

careers tend to move into white-collar positions, in contrast to more people with careers interrupted by CMS moving into the blue-collar class.

***Critical Moves between Social Classes***

On basis of the findings above, entry into specific classes has different tendencies of timing that interact with gender and career stage. This section further explores mechanisms of four kinds of critical moves, from employees to owners, from fundamental workers to managers, from non-professional to professional employees, and between white-collar and blue-collar positions, which respectively brings significant changes in production relations, levels of authority, autonomy, and work content. Table 5.14 presents the estimates of Cox models for six destination classes using all class transitions of the total population.[75]

First, gender differences are found in every kind of transition: males have higher transition rates of entry into Classes I through V, as well as blue-collar positions, and females are more restricted to moving towards the white-collar class. Moreover, people with careers interrupted by CMS generally have no different levels of transition rates than other people, except for entry into professional and white-collar classes. This is probably because their level of education is lower than that of other people, on average.

[75] Models in Table 5.13 only use related information in careers after CMS to analyze class transitions occurring in this period for people with careers interrupted by CMS. In addition, seven covariates of social background (birth cohorts II and III, educational cohort, father's occupation and ethnicity) are also controlled in models, but their estimated effects are skipped here for simplification.

Table 5.14 Critical Class Moves, All Population (Cox Models)

| Class Entry | Model A. Employer | Model B. from employee to Self-Employed | Model C. Manager | Model D. from non-prof. to Professional employee |
|---|---|---|---|---|
| Sex | 0.78(2.19)*** | 0.66(1.94)*** | 0.66(1.93)*** | 0.59(1.80)*** |
| People with careers interrupted by CMS | 0.23(1.25) | 0.28(1.32) | -0.07(0.93) | -0.94(0.39)*** |
| **Covariates of Human Capital** | | | | |
| Education (school year) | 0.05(1.05) | -0.02(0.98) | 0.19(1.21)*** | 0.20(1.22)*** |
| College | -0.09(0.91) | -0.75(0.47)* | -0.05(0.95) | -0.14(0.87) |
| Further education | 0.35(1.42) | 0.24(1.27) | 0.69(1.99)** | 0.41(1.50) |
| **Job History Covariates** | | | | |
| General labor force experience | -0.10(0.91) | 0.01(1.01) | 0.09(1.10) | -0.01(0.99) |
| Firm-specific labor force experience | -0.07(0.93) | 0.01(1.01) | 0.01(1.01) | -0.15(0.86)* |
| Number of previous class | 0.33(1.40)* | 0.28(1.33)* | 0.07(1.07) | 0.05(1.05) |
| First status (Prestige) | 0.01(1.01) | -0.03(0.97) | -0.02(0.99) | -0.06(0.94)** |
| **Origin Class** (Class VII and VIII as reference) | | | | |
| Class I: employer | - | - | 0.76(2.15)* | - |
| Class II: self-employed | -0.33(0.72) | - | -0.09(0.91) | - |
| Class III: professional | -0.95(0.38) | -0.45(0.64) | 0.60(1.82) | - |
| Class IV: associate professional | 0.62(1.86)* | 0.66(1.93) * | 1.55(4.71)*** | - |
| Class V: manager | 0.68(1.97)** | -0.00(1.00) | - | 0.11(1.12) |
| Class VI: white-collar worker | 0.44(1.55) | 0.59(1.80)*** | 0.99(2.70)*** | 0.63(1.89)*** |
| **Life Event Covariates** | | | | |
| Married | -0.38(0.68) | -0.08(0.93) | -0.40(0.67) | -0.65(0.52)* |
| Parenthood | 0.48(1.61) | -0.39(0.68) | -0.10(0.91) | 0.03(1.03) |
| **Labor Market Conditions** | | | | |
| CE1: Industrialization | 0.01(1.01) | 0.45(1.57) | 1.01(2.75) | 0.56(1.75) |
| CE2: Economic cycle | -0.03(0.97) | -0.03(0.97) | -0.08(0.92) | 0.05(1.05) |
| Number of events | 175 | 222 | 181 | 205 |
| Log likelihood (final estimates) | -1203.19 | -1521.03 | -1146.93 | -1255.98 |
| Likelihood-ratio statistics (Model $\chi^2$) | 152.216*** | 88.2788*** | 329.2562*** | 395.602*** |
| Degrees of freedom | 25 | 24 | 25 | 22 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level and *** at the 0.001 level. The relative risk ratio is in parentheses.

Table 5.14 Critical Class Moves, All Population (Cox Models), (continued)

| Class Entry | Model E. from blue-collar to white-collar workers | Model F. from white-collar to blue-collar workers |
|---|---|---|
| Sex | -1.14(0.32)*** | 0.81(2.25)** |
| People with careers interrupted by CMS | -0.87(0.42)* | -0.45(0.64) |
| **Covariates of Human Capital** | | |
| Education (school year) | 0.23(1.26)*** | -0.10(0.91)* |
| College | -0.76(0.47) | -0.91(0.40)* |
| Further education | 0.22(1.24) | 0.70(2.02) |
| **Job History Covariates** | | |
| General labor force experience | -0.14(0.87) | 0.12(1.12)* |
| Firm-specific labor force experience | -0.15(0.86)* | -0.06(0.94) |
| Number of previous class | 0.12(1.13) | -0.06(0.94) |
| First status (Prestige) | -0.02(0.98) | -0.06(0.94)* |
| **Origin Class** (Class VII and VIII as reference) | | |
| Class I: employer | - | - |
| Class II: self-employed | - | - |
| Class III: professional | - | - |
| Class IV: associate professional | - | - |
| Class V: manager | - | - |
| Class VI: white-collar worker | - | - |
| **Life Event Covariates** | | |
| Married | -1.25(0.29)* | -0.08(0.92) |
| Parenthood | -0.21(0.81) | 0.01(1.01) |
| **Labor Market Conditions** | | |
| CE1: Industrialization | -1.92(0.15)* | 1.10(3.00) |
| CE2: Economic cycle | 0.03(1.04) | -0.16(0.85) |
| Number of events | 153 | 103 |
| Log likelihood (final estimates) | -786.292 | -489.47 |
| Likelihood-ratio statistics (Model $\chi^2$) | 269.7494*** | 112.7818*** |
| Degrees of freedom | 20 | 20 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level and *** at the 0.001 level. The relative risk ratio is in parentheses.

Analyzing class entry into employers and self-employed, respectively, results in Models A and B showing each kind of transition associated with different origin classes. Class I is more accessible to managers; in contrast, Class II is more open to white-collar employees than to blue-collar workers, while associate professionals are positively correlated with both kinds of class entry. For Class I entry, human capital does not show any significant influence. Only number of previous classes partially explains the likelihood of entry into this class. This implies that becoming an employer is more related to one's own history of status attainment than to his/her background.[76] For becoming self-employed, having a college degree discourages people from getting into self-employment by decreasing transition rates by more than half. This corresponds to findings in previous research (Sheu and Hwan, 2002; Shieh 1992b, 1993; Yu and Su 2004) that self-employment is a significant alternative for upward mobility in Taiwan, especially for low-educated and low-skilled workers.

Model C examines class mobility from fundamental employees to managers and supervisors. Results show that this kind of transition is strongly associated with human capital. Taking further education (i.e., job training leading to occupational qualification or related courses that issue a certificate) doubles the likelihood of entering the managerial class. Compared with people in other classes, associate professionals are the most likely to become managers (the relative ratio reaches 4.71), followed by white-collar workers and employers. In Model D, class entry into professional classes (including Classes III and IV) from other salaried workers depends on higher formal education and is highly restricted to males with continuous careers. Among employees in Classes V through VIII, professional classes are a destination point for white-collar workers.

[76] The effects of seven background covariates not shown in the table are not significant at the 0.05 level in this model as well.

Finally, movements between white- and blue-collar positions have contrary associations with gender and education. Class VII of blue-collar positions is a domain of men and low-educated people, especially those without college degrees, and the opposite is the case for class entry into becoming white-collar workers. These findings indicate that the attainment of these two classes is very different from each other, and therefore it is not appropriate to put them together in one category, as Goldthorpe (1980) did. In addition, the positive effect of general labor force experience in Model F implies that class entry from white-collar into blue-collar positions tends to happen early in careers. This kind of move may occur as an adjustment step in the process of job matching in early career stages.

## 5.3 CONCLUSION AND DISCUSSION

Using occupational prestige and social class to define class change, this chapter examines the time-dependence of class mobility, as well as its interactions with gender and the timing of taking CMS in careers. Taiwanese people experience three jobs and two classes throughout their careers, on average, and they do not stay in the first class significantly longer than subsequent ones. Between first and current positions, there is not much difference in occupational prestige, on average, and the correlation between them is quite high, except for people with careers interrupted by CMS. Through comparing the frequencies of job shifts and class moves occurring at different times in careers, results show that status attainment is a long-term process in which occupational prestige steps up relatively fast and frequently in the beginning, but critical transitions across social classes tend to happen later. These findings support Hypotheses IIa. and IIb.: that compared to job mobility, class attainment is more stable and consistent throughout the lifetime, and job mobility in later careers is more likely to involve class mobility even if job changes are much less frequent in this phase.

Importantly, I concluded in the last chapter that diverse patterns of job mobility among career stages and gender differences arise mainly in transitions out of jobs initially held in early careers. After specifying the directions of job mobility, however, results show that it is lateral shifts, and not those bringing significant change in occupational prestige, that have gender differences as well as divergent mechanisms throughout careers. Upward and downward mobility both keep consistent patterns that are free of fluctuation in labor-market conditions and only affected by individuals' human capital, job histories, and important life events.

For the transition between social classes, moving into ownership (including employers and self-employed) in later careers is a main stream for all Taiwanese people even though women have much lower transition rates than do men.[77] Individuals who are employers change classes less frequently than their counterparts in other classes. In contrast, those in associate professional, white-collar, and blue-collar classes have much higher transition rates than other people. At the beginning of careers, high proportions of class entry are toward associate professional, white-collar, and blue-collar positions, in contrast to most class changes moving into self-employed, owners, as well as managers in later careers. With regard to which class people enter into, basically there is a natural affinity between classes. For example, employers and managers are more likely to transition between each other, and managerial class and self-employment are main destination points of mobility for both associate professionals and white-collar workers. The attainment of managerial and professional classes depends on formal education, and taking further education after schooling doubles the likelihood of entering into managerial classes.

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[77] A significant part of married women work for small family enterprises as a "boss's wife" rather than having her own business (Lu 2001). This group of women actually takes charge of the family business, but their employment status is categorized as "working for family with or without pay" in national and social surveys.

In addition, class entry into the employer class is not affected by any individual human capital, but only by origin class and number of previous classes, indicating that this status attainment is based more on one's achievement in the labor market than on the influence of social background. For class entry into self-employment, the negative effects of college degree showed in the outcomes correspond to findings in previous research, in which becoming one's own boss is an alternative method of upward mobility for people with an educational disadvantage..

***Class Mobility for People Who Take CMS at Different Times***

In Taiwan, the regulatory age of taking CMS is over 18 years old, and attending college and graduate school is the only way to postpone the timing, through draft deferrals. As a consequence, 73.08% of males with continuous careers have an undergraduate or graduate school degree. The institutional setting of CMS in Taiwan creates two groups of males with divergent patterns of status attainment, which mainly results from their distinct levels of education. Results in the last section of this chapter show that people with careers interrupted by CMS have lower transition rates of class moves only in classes associated with a high-education requirement (i.e., professional and white-collar classes); otherwise, there is no difference in entry into other classes between these groups of males.

Taking advantage of being both male and highly educated, those starting their careers after fulfilling CMS enjoy the highest level of occupational prestige, on average, and among other people, they also have the highest proportion in the professional and managerial classes for both their initial and current classes. They move across social classes relatively more frequently in early than later in careers and experience fewer job changes to make a class move. In contrast, people with careers interrupted by CMS have the lowest level of occupational prestige in the population, on average. Most start careers

in blue-collar positions, but a very high proportion (29.84%) become self-employed or employers right after re-entering the labor force from the military, and the proportion increases even in their current classes.

With respect to the general impression in Taiwan that work before CMS is a stopgap and that males' careers formally start after being discharged from CMS, I am unable to make a conclusion based on findings in this chapter, because the mechanisms of class mobility in careers before CMS, as well as the relation between status attainments before and after CMS, still need more analyses. I am able to provide some relevant, but apparently contrary findings, however, which may provide some understanding about this issue. First, using prestige change to define directions of job mobility, Figure 5.2 shows that over 20% of job changes occurring before CMS are upwardly mobile, and this proportion is equivalent to their counterparts for other groups of males and even higher than those for females (Figure 5.1). Moreover, this group of people experiences fewer job changes per class move in careers before CMS, on average, than do other people in early careers (Table 5.11). Results in Table 5.13, however, show a lower proportion of class moves (36.97%) taking place in careers before CMS in relation to their counterparts occurring within first five years in careers for other people (42.68% and 53.23% for females and males with continuous careers, respectively). These findings suggest that careers before CMS may occur in a period during which both upward mobility in occupational prestige and mobility across social classes are relatively easily compared to those occurring in early careers of other people, but few class moves may actually occur during this period. Since there are median correlations between first jobs, first positions after CMS and current jobs ($\gamma = 0.5425$ and 0.6445, respectively), careers before CMS may not be a stopgap, but instead help status attainment after CMS. In addition, given a low correlation of prestige between first and current jobs for this group

of people ($\gamma = 0.4184$), analyzing only the relation between first and current statuses and not considering the process of status attainment in between would lead to biased results, especially for this group of people.

# Chapter 6: Mobility in a Segmented Labor Market

This chapter focuses on the impacts of structural constraints on job mobility in Taiwan's labor market. Based on findings in existing research about the distinct forms of status attainment and different employment conditions between public and private sectors in Taiwan, I consider using the division of public/private sectors as a segmentation to investigate the effects of entering into specific segments on job mobility and its time-dependence throughout careers. Given that a considerable number of small and medium enterprises (SMEs) and a small proportion of large firms constitute the private sector in Taiwan, I conjecture that heterogeneity of job mobility exists in these two types of corporations, and that job mobility in large firms is more parallel with that in the public sector than in SMEs. To test this, Section 6.1 examines the shapes of job shifts departing from the public sector, large firms, and SMEs respectively by graphing the results of piecewise constant exponential models, and finds that the private sector has homogeneity of rapid job mobility among large firms and SMEs in contrast to low levels of transition in the public sector.

Based on this finding, Section 6.2 takes selection bias into account and analyzes the effects of initial attainment in the public sector on subsequent job mobility. Regarding entry into the public sector as a treatment, selection bias resulting from heterogeneity in pre-treatment characteristics and in treatment effects are controlled and examined by the propensity-score method and hierarchical linear models (HLM), respectively. The former method is adopted to evenly distribute pre-existing characteristics among people in either segment, and the latter model is constructed to detect whether the treatment effects of segmentation are heterogeneous, varying systematically with education or other important individual characteristics. Finally, considering that organizational settings

pertaining to job ladders and means of recruitment within firms may affect people's decisions about job mobility, Section 6.3 further investigates how the effects of segmentation blend with organizational influences and jointly affect the timing, pace, and patterns of job mobility within and between public and private sectors in Taiwan.

## 6.1 SEGMENTATION IN TAIWAN'S LABOR MARKET

Table 6.1 presents percentages of all jobs in different sectors held by Taiwanese people throughout their careers, based on data for 1996. About 20% and 70% of jobs are in large firms and SMEs of the private sector, respectively. A higher proportion of females than males has ever worked/or now work in large firms. Among females and two groups of males, males with continuous careers have the lowest proportion (about 60%) of jobs in SMEs, in contrast to the highest proportion (more than 80%) of their counterparts for males with careers interrupted by CMS. Comparing jobs taken before and after CMS for this group of people, a slight decrease in the percentage of jobs in SMEs occurs after re-entering the labor force from the military.

Table 6.1 Percentage of Jobs in Different Sectors

| | Public sector | Large firms | SMEs | Total |
|---|---|---|---|---|
| Total population | 9.17 | 20.24 | 70.59 | 100(7121) |
| Females | 9.18 | 23.68 | 67.14 | 100(3214) |
| Males | 9.16 | 17.40 | 73.43 | 100(3907) |
| Males with continuous careers | 13.74 | 25.70 | 60.56 | 100(1397) |
| Males with interrupted careers | 6.61 | 12.79 | 80.60 | 100(2510) |
| Career before CMS | 5.90 | 11.52 | 82.57 | 100(1050) |
| Career after CMS | 7.12 | 13.70 | 79.18 | 100(1460) |

Note: All figures contain both censored and uncensored jobs. Frequency is in parentheses.

Table 6.2 presents the average duration of jobs in these sectors. Findings in the table indicate that public-sector jobs have a longer duration than those in any other sector,

on average, and importantly, that Taiwanese people do not hold jobs in large firms longer than they do in SMEs. This pattern remains consistent for females and two groups of males with different timings of taking CMS. In every sector, females hold jobs for a shorter time, on average, than do men. The duration of jobs taken after re-entering the labor force from the military is much longer than the average for the population in any other sector.

Table 6.2 Average Duration of Jobs in Different Sectors

| Average Duration (year) | Public sector | Large firms | SMEs |
|---|---|---|---|
| Total population | 8.80 (8.33) | 5.05 (5.74) | 5.78 (6.73) |
| Females | 7.76 (7.75) | 4.56 (4.80) | 5.31 (6.38) |
| Males | 9.66 (8.69) | 5.59 (6.61) | 6.14 (6.96) |
| Males with continuous careers | 10.73 (8.78) | 5.44 (6.21) | 5.87 (7.40) |
| Males with interrupted careers | 8.42 (8.46) | 5.76 (7.03) | 6.25 (6/77) |
| Career before CMS | 2.55 (1.95) | 2.48 (1.85) | 3.32 (2.51) |
| Career after CMS | 11.92 (8.90) | 7.74 (8.18) | 8.45 (8.02) |

Note: Standard deviation is in parentheses.

To explore trajectories of job change departing from different sectors, Figures 6.1 and 6.2 graph their rates estimated by piecewise constant exponential models with 2-year time intervals for people with continuous and interrupted careers, respectively.[78]

[78] For males with careers interrupted by CMS, for simplification, Figure 6.2 graphs only the transition rates for jobs taken after re-entering the labor force from military.

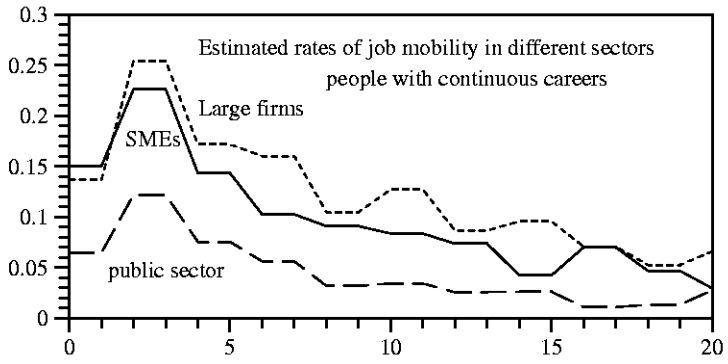


Figure 6.1 Piecewise Constant Exponential Rates (in 2-Year Intervals) of Job Change in Different Sectors, People with Continuous Careers

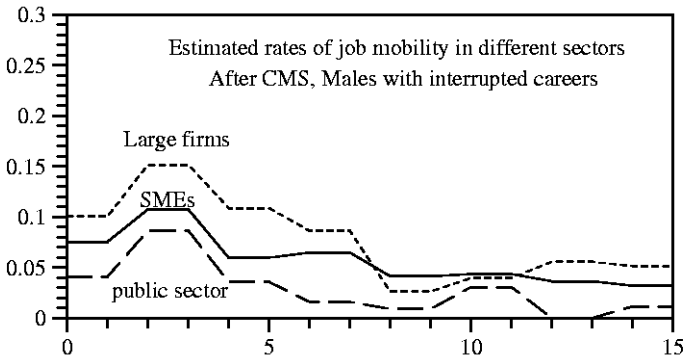


Figure 6.2 Piecewise Constant Exponential Rates (in 2-Year Intervals) of Job Change after CMS in Different Sectors, People with Careers Interrupted by CMS

Both figures show that the transition rates of jobs in large firms are generally higher than those of jobs in SMEs, and that public positions have the lowest transition rates among jobs in the three sectors. Results from a set of piecewise constant exponential models (which are not shown here) separated by gender show that both males and females follow this pattern as well.

Table 6.3 presents average transition rates of jobs in different sectors estimated by exponential models. Corresponding to the findings above, for both genders, jobs in large firms, rather than those in SMEs, have the highest rates of transition, and public positions have the lowest levels of transition rates among the three sectors.

Table 6.3 Estimated Transition Rates of Job Change in Different Sectors

| | Public sector | Large firms | SMEs |
|---|---|---|---|
| Total population | .0605(348) | .1522(1107) | .1253(3644) |
| Females | .0760(174) | .1768(614) | .1420(1627) |
| Males | .0503(174) | .1298(493) | .1145(2017) |
| Males with continuous careers | .0364 (75) | .1240(242) | .1099(546) |
| Males with interrupted careers | .0708 (99) | .1359(251) | .1163(1471) |
| Career before CMS | .3924(62) | .4027(121) | .3008(867) |
| Career after CMS | .0298(37) | .0840(130) | .0619(604) |

Note: Frequency is in parentheses.

All findings in this section consistently indicate that job transitions departing from large firms are more parallel with those from SMEs than those from the public sector, which rejects Hypothesis Vc. in favor of Hypotheses Va. and Vb. This leads to the conclusion that there is no heterogeneity of job mobility between large firms and SMEs in Taiwan's private sector and that public-sector jobs are less mobile than their counterparts in the private sector. Based on this finding, the analyses in following sections use the division of public/private sectors as segmentation in Taiwan's labor market to investigate the influence of entry into the public or private sector on subsequent job mobility throughout careers.

### 6.2 TREATMENT EFFECTS OF INITIAL ATTAINMENT IN THE PUBLIC SECTOR ON JOB MOBILITY

Using the division of public/private sectors as segmentation in Taiwan's labor market, I hypothesize that people initially working in the public sector change jobs less often over their work lives relative to their counterparts in the private sector. Regarding initial attainment in the public sector as a treatment, the objective in this section is to investigate whether the treatment effects of sector on transition rates of job mobility are significantly negative. Taking into account that some characteristics, such as education

and social background, which influence the likelihood of attaining public-sector positions at the time of first job, may also affect transition rates of job mobility throughout careers, I contain propensity scores in models of job mobility, with which the pre-existing attributes of first entry into the labor market will be approximately balanced among people initially working in public and private sectors.

Table 6.4 Estimated Effects of Pre-existing Characteristics on Propensity of Initial Attainment in the Public Sector (Logit Model)

| Pre-treatment covariates | Initial Attainment in Public Sector | | |
|---|---|---|---|
| | Total | Females | Males |
| Cohort 2 (35-44 years old in 1996) | -.4604(.2391)* | -.7678(.35373)** | -.1257(.3375) |
| Cohort 3 (25-34 years old in 1996) | -.8574(.3542)** | -1.3409(.49216)*** | -.1052(.5329) |
| Educational cohort | -.2472(.2432) | -.6210(.36639) | .1219(.3327) |
| Father's occupation: Owners | -.0173(.1629) | .2508(.24344) | -.2337(.2268) |
| White-collar workers | .0480(.0907) | .2943(.13234) ** | -.2316(.1357) |
| Ethnicity: Mainlanders | .1828(.1798) | .1735(.26160) | .2291(.2549) |
| Starting career without fulfilling CMS | -.4550(.1829)** | - | -.7625(.2443)*** |
| Education (school year) | .2825(.0295)*** | .2652(.04279)*** | .3191(.0425)*** |
| College degree | -.0879(.2132) | .1553(.31404) | -.4038(.2974) |
| CE1:Industrialization | -.3051(.1840) | .0419(.22781) | -.8329(.3017)*** |
| CE2:Economic cycle | -.0262(.0619) | -.0544(.09440) | .0072(.0837) |
| Constant | -4.4111(.4489)*** | -3.5763(.59012)*** | -5.413(.6773)*** |
| Number | 2575 | 1230 | 1345 |
| Log likelihood (final estimates) | -759.96056 | -345.61036 | -401.47301 |
| Likelihood-ratio statistics (Model $\chi^2$) | 300.92*** | 168.29*** | 158.29*** |
| $R^2$ | .1653 | .1958 | .1647 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level and *** at the 0.001 level. The standard deviation is in parentheses. The reference group of father's occupation is farmers and blue-collar workers.

Using a binary logistic regression model to estimate the odds of initially attaining the public sector, Table 6.4 presents the estimated effects of pre-treatment characteristics for the total population, females, and males, respectively.[79] According to these results,

[79] For descriptive statistics of these characteristics, cf. Table 4.4.

education is a main factor in determining whether people attain public-sector positions at the time of first jobs. Males who start their careers before fulfilling CMS are less likely to enter the public sector at their first jobs than their counterparts. While males' initial attainment in the public sector is negatively associated with industrialization level at time of first entry into the labor force, while for females, such attainment is more influenced by their birth cohort and father's occupation.

***Treatment Effects under the Assumption of Homogeneity***

Incorporating predicted propensity scores into the models, I estimate average differences in job transition rates between people starting their careers in the public and private sectors. Table 6.5 presents estimates of covariates in the exponential rate models under the assumption that treatment effects on job mobility are homogeneous among people with different likelihoods of entry into the public sector.[80] Generally, people who start their careers in the public sector are less likely to change jobs, and their transition rates are about 30% to 40% lower than that of their counterparts in the private sector, conditional upon the propensity score as a function of pre-existing covariates and the covariates succeeding the treatments in the model.

[80] The total model in Table 6.5 uses all jobs ever held by the total population. To specify whether people engaged in CMS before beginning their careers, the covariate of "starting careers without fulfilling CMS" is controlled in the function of propensity scores, and the covariate of "jobs before CMS" is contained in the exponential rate model to differentiate the extremely fast transition of jobs taken in careers before CMS.

Table 6.5 Effects of Initial Attainment in the Public Sector on Job Mobility under the Assumption of Homogeneity (Exponential Transition Rate Models)

| | Total | Females | Males |
|---|---|---|---|
| Constant | -0.92(0.40)** | -0.52(0.59) | -2.09(0.12)*** |
| Discontinuous jobs | 0.54(1.72)*** | 0.38(1.47)*** | 0.92(2.51)*** |
| Propensity scores | 0.39(1.48)** | 0.15(1.16) | 0.51(1.67)* |
| Sex | -0.30(0.74)*** | - | - |
| Jobs before CMS | 1.05(2.86)*** | - | 1.22(3.40)*** |
| Further education | 0.11(1.11)** | -0.03(0.97) | 0.20(1.22)*** |
| General labor force experience | -0.05(0.95)*** | -0.04(0.96)*** | -0.04(0.96)*** |
| Firm-specific labor force experience | -0.09(0.91)*** | -0.09(0.92)*** | -0.09(0.92)*** |
| Number of previous jobs | 0.08(1.08)*** | 0.08(1.08)** | 0.10(1.11)*** |
| First class (Prestige) | -0.01(0.99) | -0.01(0.99) | 0.00(1.00) |
| **Initial attainment in the public sector** | **-0.54(0.58)*** ** | **-0.36(0.70)*** ** | **-0.38(0.68)*** ** |
| Married | -0.46(0.63)*** | -0.53(0.06)*** | -0.41(0.66)*** |
| Parenthood | -0.22(0.80)*** | -0.22(0.08)** | -0.25(0.78)** |
| PE1:Industrialization | 0.37(1.44)*** | 0.33(0.03)*** | 0.39(1.48)*** |
| PE2: Economic cycle | -0.02(0.98) | -0.01(0.02) | -0.03(0.97) |
| Number | 5099 | 2415 | 2684 |
| Log likelihood (final estimates) | -14321.1 | -6673.59 | -7620.43 |
| Likelihood-ratio statistics (Model $\chi^2$) | 3082.505*** | 971.3082*** | 2078.758*** |
| Degrees of freedom | 13 | 11 | 12 |

Note: * statistically significant at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses.

### *Heterogeneous Effects of Initial Attainment in the Public Sector on Job Mobility*

To further detect whether the treatment effects of initial attainment in the public sector change systematically with different likelihoods of entry into this sector, I generate propensity-score strata among which the pre-treatment characteristics are balanced between treated and untreated individuals. Table 6.6 shows the number of cases in each stratum. We find that the frequency of cases for initial attainment in the public sector increases with propensity scores, while their counterparts in the private sector have the opposite trend. Through this, within each propensity stratum, the average propensity

score and the means of each covariate are significantly similar among the treated and untreated individuals. This solves statistically the problem resulting from heterogeneity in the pre-treatment characteristics.

Table 6.6 Frequency in Propensity Stratum of Initial Attainment in the Public Sector

| Total population | | | Females | | | Males | | |
|---|---|---|---|---|---|---|---|---|
| P-Score | Public sec. | Private sec. | P-Score | Public sec. | Private sec. | P-Score | Public sec. | Private sec. |
| [0.00, 0.05) | 19 | 909 | [0.00, 0.05) | 11 | 483 | [0.00, 0.05) | 11 | 499 |
| [0.05, 0.10) | 48 | 680 | [0.05, 0.10) | 23 | 328 | [0.05, 0.10) | 25 | 313 |
| [0.10, 0.20) | 89 | 427 | [0.10, 0.20) | 31 | 162 | [0.10, 0.20) | 44 | 234 |
| [0.20, 0.40) | 86 | 209 | [0.20, 0.40) | 42 | 85 | [0.20, 0.40) | 48 | 112 |
| [0.40, 1.00) | 50 | 58 | [0.40, 1.00) | 30 | 120 | [0.40, 1.00) | 27 | 32 |
| Total | 292 | 2283 | Total | 137 | 1093 | Total | 155 | 1190 |

Estimating treatment effects in each stratum by a set of exponential rate models, Table 6.7 presents estimated effects in full models of the total population under the assumption of heterogeneity.[81] Tables A1 and A2 in the Appendix provide the full models of the treatment effects on job mobility among propensity strata for females and males, respectively. Based on the results in Table 6.7, treatment effects are insignificant at both the highest and lowest propensity strata, and their strength increases with the likelihood of entering into this sector. Table 6.8 summarizes stratum-specific treatment effects for the total population, females, and males, respectively. Pooling treatment effects among strata and analyzing them using HLMs, we can further detect whether treatment effects are heterogeneous, i.e., varying systematically with individuals' propensity scores (Brand and Davis 2009; Brand and Xie 2010; Xie and Wu 2005b). Using variance-weighted least squares, the second-level function in HLM regresses the estimated treatment effects among strata on the rank of propensity strata.

[81] Tables A1 and A2 in Appendix provide the full models of the treatment effects of initial attainment in the public sector on job mobility for males and females, respectively.

Table 6.7 Effects of Initial Attainment in the Public Sector on Job Mobility under the Assumption of Heterogeneity, Total Population (Exponential Transition Rate Models)

| Propensity Strata | Stratum I | Stratum II | Stratum III | Stratum IV | Stratum V |
|---|---|---|---|---|---|
| Constant | -2.37(0.62)*** | -0.51(0.63) | -0.38(0.67) | -0.13(0.96) | -1.46(1.78) |
| Discontinuous jobs | 0.55(0.07)*** | 0.49(0.08)*** | 0.42(0.09)*** | 0.78(0.13)*** | 0.88(0.22)*** |
| Propensity score | 3.75(2.04)† | 2.16(1.94) | 0.16(1.19) | 0.93(0.88) | -0.73(0.85) |
| Sex | -0.41(0.07)*** | -0.47(0.07)*** | -0.19(0.07)** | -0.14(0.10) | -0.06(0.17) |
| Jobs before CMS | 1.17(0.08)*** | 1.38(0.09)*** | 1.02(0.13)*** | 1.16(0.21)*** | 0.82(0.40)* |
| Further education | 0.29(0.07)*** | 0.11(0.08) | 0.10(0.08) | -0.06(0.12) | -0.13(0.21) |
| General labor force experience | -0.05(0.01)*** | -0.03(0.01)*** | -0.04(0.01)*** | -0.07(0.02)*** | -0.03(0.02) |
| Firm-specific labor force experience | -0.05(0.01)*** | -0.09(0.01)*** | -0.12(0.01)*** | -0.12(0.01)*** | -0.11(0.02)*** |
| Number of previous jobs | 0.18(0.03)*** | 0.03(0.03) | 0.04(0.04) | 0.04(0.06) | 0.13(0.09) |
| First class (Prestige) | 0.01(0.01) | -0.01(0.01)† | -0.01(0.01) | -0.02(0.01) | -0.00(0.02) |
| **Initial attainment in the public sector** | **-0.21(0.18)** | **-0.32(0.13)*** | **-0.43(0.10)***** | **-0.57(0.13)***** | **-0.13(0.18)** |
| Married | -0.51(0.07)*** | -0.44(0.08)*** | -0.51(0.09)*** | -0.36(0.12)** | -0.27(0.22) |
| Parenthood | -0.30(0.14)* | -0.15(0.12) | -0.09(0.09) | -0.17(0.13) | 0.21(0.27) |
| PE1:Industrialization | 0.36(0.04)*** | 0.42(0.04)*** | 0.29(0.05)*** | 0.34(0.08)*** | -0.02(0.15) |
| PE2: Economic cycle | -0.02(0.02) | -0.01(0.03) | -0.05(0.03)† | -0.01(0.04) | 0.10(0.07) |
| Number | 1943 | 1435 | 1040 | 500 | 177 |
| Log likelihood (final estimates) | -5620.21 | -3821.79 | -2733.67 | -1456.63 | -573.85 |
| Likelihood-ratio statistics (Model $\chi^2$) | 1111.54*** | 993.5494*** | 552.1026*** | 381.5978*** | 115.444*** |
| Degrees of freedom | 14 | 14 | 14 | 14 | 14 |

Note: † statistically significant at the 0.1 level, * at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The standard deviation is in parentheses.

Table 6.8 Effects of Initial Attainment in the Public Sector on Job Mobility under the Assumption of Heterogeneity (Exponential Transition Rate Models)

| | Total population | Females | Males |
|---|---|---|---|
| Stratum I | -0.21(0.18) | -0.33(0.25) | -0.14(0.23) |
| Stratum II | -0.32(0.13)* | 0.08(0.16) | -0.60(0.22)** |
| Stratum III | -0.43(0.10)*** | -0.51(0.18)** | -0.46(0.15)** |
| Stratum IV | -0.57(0.13)*** | -0.65(0.19)*** | -0.57(0.17)** |
| Stratum V | -0.13(0.18) | -0.45(0.23) † | 0.01(0.26) |

Figures 6.3 through 6.5 plot the results of HLMs for the total population, males, and females, respectively. "Dots" in the figure refer to point estimates of stratum-specific treatment effects of initial attainment in the public sector on job mobility rates. Within each stratum, solid lines mark the range of estimated treatment effects people have in ±2 standard deviations of stratum-specific means, which covers 95% of probability in normal distributions. The dashed-linear plots present the regression function of stratum-specific treatment effects on propensity strata based on the level-2 models of HLMs.

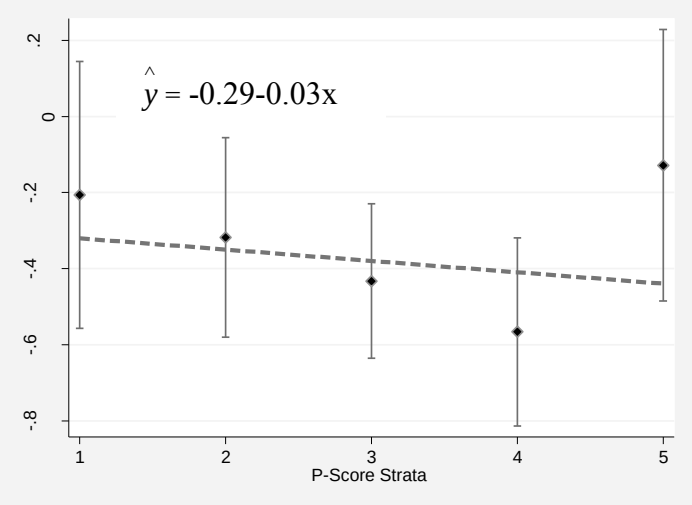


Figure 6.3 Heterogeneous Treatment Effects, Total Population

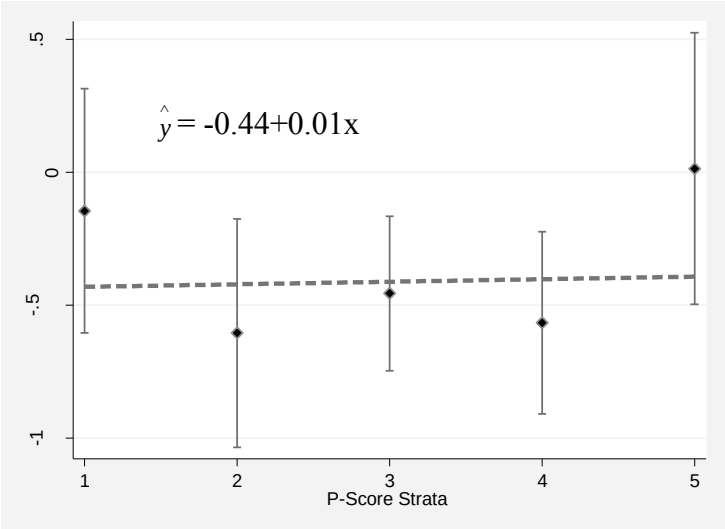


Figure 6.4 Heterogeneous Treatment Effects, Males

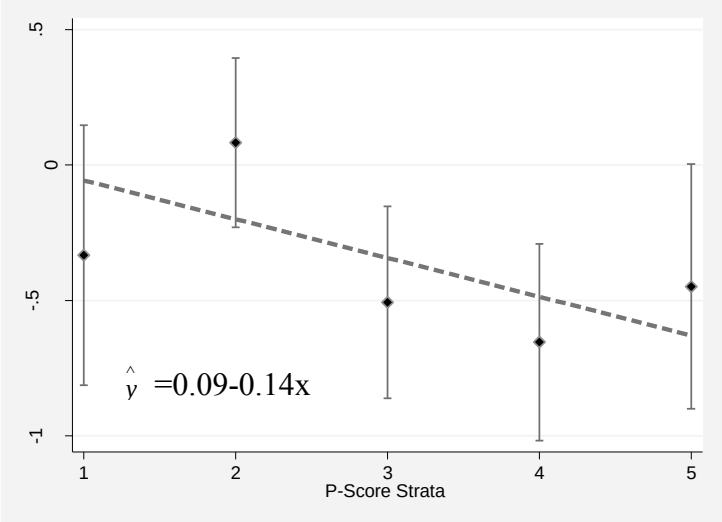


Figure 6.5 Heterogeneous Treatment Effects, Females

We can see that the regression functions in Figures 6.3 and 6.4 (for total population and males, respectively) do not show salient trends of treatment effects with propensity strata, nor are their level-2 models of HLMs statistically significant. For females, however, the level-2 model of HLMs provides a good fit at the 0.05 significance

level, and the slope coefficient is significant via t-tests as well. The plots in Figure 6.5 show that there is a tendency for a relationship between propensity and the negative effects of initial attainment in the public sector. The higher the likelihood of entering the public sector at the time of first job, the lower are the transition rates of job mobility throughout females' careers.

In brief, while for Taiwanese men the treatment effects are homogeneous, not changing by the propensity of attaining the public sector at the time of first job, effects of initial attainment in the public sector on job mobility are heterogeneous for Taiwanese women: Those who are most likely to enter the public sector at the beginning of their careers benefit most in terms of their low transition rates of job mobility.

### 6.3 INTER-SECTOR AND INTRA-SECTOR MOBILITY IN TAIWAN

Given findings in the last section that people who start their careers in the public sector enjoy lower rates of job mobility relative to their counterparts in the private sector, this section further analyzes job transitions within and between these two segments in Taiwan. First, I present descriptive statistics for initial attainment in public and private sectors and examine first inter-sector transition for Taiwanese people. Based on these findings, job transitions are then investigated in models with a competing risk of sector-specific destinations, i.e. within or between sectors. Considering that organizational settings pertaining to job ladders and methods of recruitment within firms may also impact the pace and direction of job change, I incorporate relevant organizational attributes and investigate how they interact with segmentation in Taiwan's labor market and jointly affect job mobility throughout careers.

### 6.3.1 Initial Sector Attainment and its Transition

Tables 6.9 through 6.13 present statistics about initial sector attainment of Taiwanese people. Table 6.9 presents percentages of Taiwanese people who start their careers in the public and private sectors. While men and women have approximately the same proportions of initial attainment in the public sector, there is a striking disproportion within men who engage in CMS at different times in careers. Men fulfilling CMS before beginning their careers have a proportion of initial attainment in the public sector almost triple that of men with careers interrupted by CMS.

Table 6.9 Percentages of Initial Attainment in the Public and Private Sectors

| | Public sector | Private sector | Total N. |
|---|---|---|---|
| Total population | 11.34 | 88.66 | 2575 |
| Females | 11.14 | 88.86 | 1230 |
| Males | 11.52 | 88.48 | 1345 |
| Males with continuous careers | 18.18 | 81.82 | 583 |
| Males with interrupted careers | 6.43 | 93.57 | 762 |

Table 6.10 Distribution of Initial Sector Attainment

| | Initial sector attainment | | |
|---|---|---|---|
| | Public sector | Private sector | Total |
| Stay in initial sector | 188 (64.38%) | 2110 (92.42%) | 2298 (89.24%) |
| Move to the other sector | 104 (35.62%) | 173 (7.58%) | 277 (10.76%) |
| Total | 292 (11.33 %) | 2286 (88.67 %) | 2578 (100%) |

Note. All percentages are column percentages except for those in the last row, which are row percentages.

Table 6.10 show distributions of initial sector attainment by its alternative destinations, i.e., staying in the same sector or transitioning to the other sector. Based on data in 1996, 11.33% and 88.67% of individuals start their careers in the public and private sectors, respectively. Most people stay in their initial sector throughout their careers. The private sector constrains people within sectors more strongly than does the

public sector. According to the table, 92.42% versus 64.38% of people starting their careers in private or public sectors work in the same sector throughout their work lives.

Table 6.11 Number of Jobs People Hold in Initial-Sector Attainment

| Number of jobs | Public sector (n=292) | Private sector (n=2286) |
|---|---|---|
| 1 | 212 (72.60) | 497 (21.74) |
| 2 | 53 (90.75) | 671 (51.09) |
| 3 | 17 (96.58) | 571 (76.07) |
| 4 | 5 (98.29) | 291 (88.80) |
| 5 | 2 (98.97) | 124 (94.23) |
| More than 5 | 3 (100) | 122 (100) |
| Mean (Std. Dev.) | 1.43(0.91) | 2.71(1.48) |

Note: Except for the last row, accumulative percentages are in parentheses in the table. In the last row, the standard deviation of job number held in initial-sector attainment is in parentheses.

However, employment in the private sector is more unstable than that in the public sector. Table 6.11 presents the number of jobs held in the sector of first entry into the labor force. More than 90% of people with initial attainment in the public sector hold one to two jobs, compared to four jobs held by their counterparts in the private sector. T-tests show that the average job numbers in these two segments are significantly different from each other at the 0.05 level.

Table 6.12 Mean Duration (years) and Transition Rates of Initial Sector Attainment

| | Initial sector attainment | |
|---|---|---|
| | Public sector | Private sector |
| Stay in initial sector | 18.30 | 18.54 |
| Move to the other sector (transition rate) | 4.45 ($r$ =0.0266) | 5.77 ($r$ =0.0043) |

Table 6.12 shows average durations of initial sector attainment and rates of transition moving to the other sector estimated by exponential rate models. The average duration for people who never change their sector attainment is about 18 years in each sector, but for those shifting across sectors they have stay in their initial sector about five

years on average. The transition rate from private to public sectors is much lower than that of movement in the other direction.

Table 6.13 Distribution of Transition from Initial- to Second-Sector Attainment by Timing of Occurrence in Careers

| Years in Careers | From public to private sector | From private to public sector |
|---|---|---|
| Within 5 years | 71 (68.27) | 104 (60.12) |
| 5-10 | 21 (88.46) | 36 (80.92) |
| 10-15 | 7 (95.19) | 16 (90.17) |
| After 15 years | 5 (100) | 17 (100) |
| Total | 104 | 173 |

Note: Accumulative percentages are in parentheses.

Table 6.13 further presents the distribution of inter-sector transition by the timing of occurrence in careers. We can see that people tend to switch to different sectors early rather than later in careers. More than 60% of these moves occur within the first five years, and few happen after 15 years in careers.

All findings in this section indicate that there is strong segmentation between public and private sectors in Taiwan and that people seldom change their sectors in the labor market throughout their work lives. The salient disproportion of inter-sector transition toward the public and private sectors indicates that the threshold of entering the public sector is higher than that of the private sector.

### 6.3.2 Organization and Segmentation

To explore interactions between segmentation and organization, this section includes organizational settings concerning job ladders and promotion to analyze job transition in Taiwan's segmented labor markets. Table 6.14 presents proportions of organizational attributes incorporated in analyses under different segments.

Table 6.14 Proportion of Organizational Covariates

| | Public sector | Private sector | All jobs |
|---|---|---|---|
| Promotion experience | 9.97% | 6.42% | 6.74% |
| Promotion opportunity | 43.19% | 26.24% | 27.79% |
| Importance of seniority | 54.82% | 33.98% | 35.89% |
| Recruitment (internal promotion) | 22.97% | 14.53% | 15.31% |
| Job security | 74.89% | 63.78% | 64.79% |

All proportions of five organizational covariates in the table are significantly different between the public and private sectors at the 0.001 level of proportion tests. We can find that public corporations in Taiwan have characteristics of internal labor markets, where seniority is appreciated and the potential incumbent of a vacant position tends to be recruited from current employees than from people outside the firm. People working in the public sector are more likely to be promoted, have promotion opportunities, and feel a high degree of long-term employment in their jobs than their counterparts in private enterprises.

Incorporating organization covariates in analyses, Tables 6.15 and 6.16, respectively, present the frequency count of job spells ending with an event (i.e., transition within or across segments) and estimates of covariates in exponential rate models for mechanisms of job transitions within and between public and private sectors.

Table 6.15 Frequency of Transition from Initial to Second Sector Attainment by Timing of Occurrence in Careers

| | Origin Sector | | |
|---|---|---|---|
| Destination sector | Public sector | Private sector | Total |
| Public sector | 169 (48.56%) | 253 (5.33%) | 422 (8.28%) |
| Private sector | 179 (51.44%) | 4498 (94.67%) | 4677 (91.72%) |
| Total | 348 (6.82%) | 4751 (93.18%) | 5099 (100%) |

Note: All percentages are column percentages except for the last row, which are row percentages.

Beginning with frequency of events, Table 6.15 shows that employment is much more stable in the public sector than in the private sector, because more than 90% of job

changes depart from the private sector. People working in the public sector have approximately equal proportions of inter- and intra-sector mobility, but both frequencies are quite low. For those in the private sector, most transitions are within the segment, and only 5.33% of them switch to the public sector.

Specifying four kinds of transitions--intra-sector mobility within each segment, as well as inter-sector mobility from private to public sectors and from public and private sectors--a set of exponential rate models analyzes how internal settings of employment in organizations influence the sector transition of Taiwanese workers. Because job change within the private sector has a much higher frequency count than the other three types of transition (n = 4,498), the number is standardized to approximate the size of intra-sector mobility within the public sector (n = 169).[82]

According to results of the exponential rate models in Table 6.16, among four types of mobility, only gender and formal education are associated with transition to public-sector (Model A and C). Females tend to be constrained within the private sector, and if they are in the public sector, their employment is more unstable than their male counterparts'. With respect to the influence of life events, marriage and having first children do not affect employment within the public sector, but they negatively impact intra-sector mobility in the private sector, as well as two kinds of inter-sector transition. Finally, after destination segments of job mobility are specified, cohort effects of labor-market conditions, which are found to have long-term effects on job mobility in Chapter Four, do not show significant effects on any kind of transition in the table. This indicates that patterns of job change within and between segments are independent from external conditions in the labor market. Inter- and intra-sector mobility run consistently in a manner similar to that of upward and downward mobility, as found in the last chapter.

[82] For the rationale and a detailed demonstration for episode standardization, please refer to Blossfeld and Rohwer (2002:107-109).

Table 6.16 Mechanisms of Job Mobility within and between Public and Private Sectors in Taiwan (Exponential Transition-Rate Models)

| | Intra-Sector Mobility | | Inter-Sector Mobility | |
|---|---|---|---|---|
| | **Model A** | **Model B** | **Model C** | **Model D** |
| | **Within public sec.** | **Within private sec.** | **From private to public sec.** | **From public to private sec.** |
| Constant | -7.87 (0.00)*** | 1.13 (3.10) | -3.09 (0.05)* | 0.65 (1.92) |
| Discontinuous jobs | 0.70(2.02)** | 0.42(1.52) † | 0.87(2.40)*** | 0.97(2.63)*** |
| Sex | -0.39(0.68) † | -0.04(0.96) | -0.51(0.60)** | -0.25(0.78) |
| People with interrupted careers by CMS | 0.09(1.10) | -0.41(0.66) | 0.45(1.57) † | 0.10(1.11) |
| Jobs before CMS | 2.59(13.29)*** | 1.13(3.10)*** | 0.12(1.12) | 0.86(2.37)* |
| Education (school year) | 0.10(1.10)** | 0.00(1.00) | 0.16(1.17)*** | -0.01(0.99) |
| College | 0.38(1.47) | 0.03(1.03) | 0.36(1.44) † | -0.36(0.70) |
| Further education | 0.03(1.03) | -0.26(0.77) | -0.09(0.92) | 0.61(1.83)** |
| General labor force experience | 0.05(1.05) | 0.01(1.01) | -0.07(0.93)* | -0.05(0.95) |
| Firm-specific labor force experience | -0.09(0.92)* | -0.01(0.99) | -0.07(0.93)* | -0.06(0.94) † |
| Number of previous jobs | -0.00(1.00) | 0.09(1.09) | -0.06(0.95) | -0.01(0.99) |
| First class (Prestige) | 0.04(1.05) † | -0.03(0.97) | -0.02(0.98) | -0.04(0.96) † |
| Initial attainment in the public sector | -0.01(0.99) | 0.29(1.34) | 0.82(2.28)** | -0.10(0.91) |
| Married | 0.01(1.01) | -0.47(0.63)* | -0.35(0.71) † | -0.65(0.52)** |
| Parenthood | 0.25(1.28) | -0.59(0.56) † | -0.48(0.62)* | 0.12(1.13) |
| **Promotion experience** | -0.90(0.41)** | -0.35(0.70) | -0.43(0.65) | -0.96(0.38)* |
| **Promotion opportunity** | -0.23(0.80) | 0.57(1.77)** | 0.08(1.08) | -0.02(0.98) |
| **Importance of seniority** | 0.23(1.26) | 0.17(1.19) | 0.02(1.02) | -0.32(0.73) † |
| **Recruitment (internal promotion)** | 0.05(1.05) | -0.04(0.96) | -0.38(0.69) † | -0.32(0.73) |
| **Job security** | -0.58(0.56)** | -0.51(0.60)** | -0.58(0.56)*** | -0.51(0.60)** |
| CE1: Industrialization | 0.28(1.32) | 0.90(2.47) | -0.43(0.65) | -0.14(0.87) |
| CE2: Economic cycle | 0.06(1.06) | -0.04(0.96) | -0.05(0.95) | -0.02(0.98) |
| PE1: Industrialization | -0.27(0.77) | -0.34(0.71) | 0.42(1.52) | 0.15(1.16) |
| PE2: Economic cycle | 0.02(1.02) | 0.04(1.04) | 0.00(1.00) | -0.06(0.94) |
| Number of events | 169 | 174 | 253 | 179 |
| Log likelihood (final estimates) | -635.1623 | -474.7944 | -1365.7485 | -674.7682 |
| Likelihood-ratio statistics (Model $\chi^2$) | 259.7322*** | 123.9268*** | 288.0326*** | 250.476*** |
| Degrees of freedom | 29 | 29 | 29 | 29 |

Note: † statistically significant at the 0.1 level, * at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The relative risk ratio is in parentheses. Six covariates of social background (birth cohorts II and III, educational cohort, father's occupation: owners and white-collar workers, and ethnicity) are also controlled in models, but their estimated effects are not significant and are not shown here for simplification.

For the influence of organizational settings on mobility in segmented labor markets, first of all, Taiwanese people pursue stable employment; they tend to stay in positions once they feel a high degree of long-term employment regardless of the segment in which they work. Job security decreases by nearly one half of rates for all

kinds of transitions. Second, promotion experience in public-sector positions encourages people to stay in their jobs (see Models A and D), but, in contrast, people who expect to have promotion opportunities in private corporations tend to quit for other jobs in the private sector (Model B). These findings indicate the basic differences in patterns of employment toward internal promotion or external shifts as upward mobility in public and private sectors, respectively. Those who work in the private sector, but tend to move to the public sector, tend to do so early rather than later in careers (a negative effect of general labor-force experience shown in Model C), and their transition depends on whether they are highly educated or have a college degree. Initial attainment in the public sector strongly fosters this kind of inter-sector transition as well. By contrast, private enterprises that recruit employees via internal promotion or provide job security tend to keep their employees in the private sector.

Finally, for inter-sector mobility from the public to the private sector (Model D), which is anomalous and not interpreted by current theories of job mobility, my analyses indicate that people who have high prestige in the initial status, have ever been promoted, and work in corporations that emphasize internal promotion and seniority tend not to have this type of transition, and that only further education fosters inter-sector transitions from the public to the private sector. Given that running one's own business is a prevalent goal for Taiwanese people, this kind of transition may be strongly associated with class moves from employees to employers or self-employed. The positive effect of further education shown here further implies that this kind of transition may lead to a change in occupations, for example, from a white-collar official to a self-employed accountant, which requires an additional investment in skills for other occupational areas. We need more research to explore this type of transition and advanced analyses to test this conjecture.

## 6.4 SUMMARY OF FINDINGS

This chapter focuses on job mobility in Taiwan's segmented labor markets. Section 6.1 first examines whether heterogeneity of job mobility exists among large firms and SMEs in the private sector, because there is a striking disproportion between these two types of establishments in Taiwan. Through comparing their trajectories of job change with that of the public sector, I find that contrary to my expectation, transition rates of jobs departing from large firms are higher than those of SMEs in Taiwan. Given that using 100 employees as a divider to define large firms is conservative for Taiwan's labor market, the finding in this research is relatively robust. Thus, the private sector is characterized by homogeneity of fast job transitions among large firms and SMEs in contrast to low levels of mobility in the public sector.

Based on this finding, Section 6.2 starts with testing heterogeneity in the treatment effects of segmentation on job mobility using initial attainment in the public sector as a treatment and then hypothesizes its negative effects on job mobility throughout careers. Considering the selection bias resulting respectively from unevenly distributed characteristics among treated and untreated people and the variation in treatment effects among different likelihoods of entering the treatment state, I construct propensity scores to balance the distributions of education and other important background characteristics among people starting their careers in private and public sectors and incorporate predicted propensity in the analyses to solve the first type of selection bias statistically. By estimating treatment effects in different propensity strata, I further investigate whether the influence of initial attainment in the public sector systematically changes with different likelihoods of entry into this segment, using a set of hierarchical linear models. Statistical results show that entry into the public sector at the beginning of careers in Taiwan stabilizes individuals' employment throughout their

careers, and that there is no significant heterogeneity in this treatment effect for Taiwanese men. For Taiwan women, however, the more likely they are to attain a position in the public sector at the time of first entry into the labor market, based on their educational achievement and social background, the more they benefit via low transition rates of job mobility in their work lives.

To examine whether sector attainment is more consistent than job attainment, Section 6.3 examines the transition of initial attainment and finds that most Taiwanese work in only one sector and that employment is much more stable in the public sector than in the private sector. Compared to their counterparts in the private sector, people initially working in the public sector are relatively free to transition across segments. For those with initial attainment in the private sector, more than 90% are constrained within the same sector throughout their careers. If inter-sector transition does occur, it tends to happen earlier rather than later in careers. All these findings delineate strong segmentation between public and private sectors in Taiwan's labor market. Initial attainment in specific segments in Taiwan is important because it affects the pace, patterns, and trajectories of subsequent job mobility throughout careers.

Finally, to explore the interacting effects of organization and segmentation on job mobility, I incorporate some organization covariates pertaining to internal employment and promotion within firms to investigate inter- and intra-sector mobility in Taiwan. I find that job security strongly discourages any kind of job transition regardless of the sector in which people work. Only in the public sector does promotion experience influence people to stay and wait for internal advancement; by contrast, in the private sector those expecting promotion opportunities within firms tend to pursue external positions in other corporations. These findings reject Hypothesis Vc. and support that

inter-firm mobility could be a means of upward mobility commensurate with climbing job ladders within firms for people working in the private sector.

With respect to other factors of job mobility, after the origin and destination sectors are specified, neither cohort nor period effects of labor market conditions affect job mobility. In relation to males, females are more likely to stay within the private sector, and they have more unstable careers even when they are in the public sector. Entry into the public sector highly depends on formal education and having a college degree. Further education, however, is strongly associated with inter-sector transitions from public to private sectors in Taiwan. This implies that this kind of transition probably involves a change not only in employment status, but also in occupations, and thus further investment in human capital and acquiring occupational certificates exert positive influence on it. This conjecture needs to be tested by more analyses.

# Chapter 7: Conclusion

Anchored in the research context of inter-generational mobility, this dissertation is an exploratory study concerning the time-dependence of career mobility throughout individuals' work lives. Using retrospective, cross-sectional data representative of the Taiwanese population in 1996, this research analyzes the jobs and status attainment that individuals had ever experienced up to the time of survey to examine whether the tempo and mechanisms of job shifts and class transitions change with time spent in careers.

Previous studies of social stratification have provided plenty of insights about structural and exchange mobility between generations. However, this understanding of social mobility pertains to a narrow time frame, i.e. father's status conventionally defined over son's age of 15, son's first job and current status. Comparisons between these points of time were insufficient without considering the context of an individual's process of career development. This research broadens current understandings of intra-generational mobility by investigating transition of jobs, classes, and sectors throughout careers. Under the assumption that status attainment is a long-term process, in which job mobility and class moves tend to change by time spent in careers, this research explores the inner nature of career development through controlling for individual, structural, and life-course factors.

From the life-course perspective, this project pays special attention to three aspects on this process. First, to connect structural change and personal employment throughout an individual's career, the cohort effects of labor market conditions at the time of first entering the labor force are constructed to locate his/her career in historical time, and the period effects of labor market conditions, which are measured at the year before the person makes any transitions, are used to identify impacts of the dynamic

structure on job mobility at the individual level. Second, the influences of two important life events, getting married and having first child, on career development are taken into account. Both of them may bring corresponding responsibilities to constrain an individual's career development or to cause different career orientations. The influences of these life events on career mobility may also differ by gender. Finally, the timing of taking compulsory military service (CMS), before or during careers, is examined to determine whether it leads to divergent patterns of career development for Taiwanese men.

This thesis begins by setting an integral frame of analyses to incorporate influences derived from individual and structural attributes and most importantly, from their joint effects interacting with time on career mobility and concludes with three empirical chapters, which respectively focus on time-dependence of job shifts, class change, and transitions between and within public and private sectors in Taiwan. Through investigating intra-generational mobility in this fashion, this project provides a thorough and multi-dimensional examination of the career development process of Taiwanese people.

***Time-Dependence of Career Mobility***

Results in this research show that job mobility is time-dependent. Job shopping and matching are intense in early careers, characterized not only by high exit rates, but also by a high proportion of jobs ending with a leave from the labor market for both genders in Taiwan. Jobs starting in early careers are sensitive to external conditions in the labor market (including both cohort effects and period effects) and to the attributes accounting for most of individuals' social background, such as formal education and initial status attainment. For jobs taken in mid-late careers, the transition is slow and controllable, depending only on individuals' job histories and important life events.

After the directions of job change are further specified, however, results indicate that it is lateral mobility, which does not bring a salient change in occupational prestige, that has the aforementioned time-dependence. Both status moves (i.e., upward and downward mobility) run in consistent ways throughout careers and are immune to external fluctuations in the labor market. For the timing of their occurrence in careers, people are more likely to climb in status prestige during early careers than during their mid-late career stages. When using the class scheme revised from conventional research of social stratification to define a class move, findings reveal that critical moves across social classes, such as entering into ownership from being an employee, tend to happen later rather than early in careers, in spite of relatively frequent upward mobility on the scale of prestige occurring in the early career stage. Furthermore, mechanisms of critical moves between social classes depend on the class from which one departs and enters. There is a natural affinity, for example, between managers and employers, and the transition between them is relatively easy and frequent compared to other classes. Moreover, professional and managerial classes are the main destination points for people departing from white-collar classes relative to those in other salaried classes.

Finally, given the consensus in existing research about the distinction between public and private sectors in Taiwan, this research investigates career mobility via sector attainment within and between segmented labor markets. I begin with testing my conjecture: Large firms in Taiwan have characteristics of internal labor markets akin to those of the public sector, which motivate employees to stay and climb up job ladders within firms. Since there is a striking disproportion between large firms and SMEs in Taiwan, the influences of large corporations may be masked by those of SMEs when we use only the division of public/private sectors to investigate job mobility in Taiwan's labor market. A graphical inspection of trajectories for jobs departing from the public

sector, large firms, and SMEs, respectively, indicates that job-exit rates of large firms in Taiwan are even higher than those of SMEs, in contrast to much lower transition rates in the public sector. Thus, no heterogeneity of job mobility exists in the private sector. Taking selection bias into consideration, I further analyze the treatment effects of initial attainment in the public sector on job mobility throughout careers. Statistical results indicate the people initially attaining the public sector enjoy stable employment throughout their careers, and women, rather than men, have heterogeneous treatment effects among different likelihoods of entrance to the public sector at the time of first entry into the labor market. Females with a high propensity for entering the public sector, which mainly depends on their social background and formal educational achievement, benefit more from entrance to the public sector at the beginning of their careers. Based on these findings, I investigate transitions between these two segments and discover strong segmentation in Taiwan's labor market. Taiwanese people rarely change sectors in their work lives, and if they do, it tends to happen in the early years rather than later in careers. People working in the public sector change jobs much less frequently and they are relatively free to transition across segments. By contrast, employment in the private sector is quite uncertain, and its workers are mostly constrained within the sector.

In summary, results in this research confirm the time-dependence of job mobility, class transitions, and sector attainment throughout careers. These occurrences have different tendencies and they are affected by specific factors in different career stages. During early careers, lateral job mobility is very frequent, and people climb in status prestige and transition across segments relatively easily. By contrast, critical movements among social classes are more likely to take place later in careers. With respect to mechanisms of these transitions, only lateral shifts without bringing salient change in prestige run in different ways among career stages, while directional job mobility

(including both upward and downward mobility), class moves among social classes, and transition across segments all keep consistent patterns, unaffected by time in careers as well as external changes in labor markets.

***Career Mobility of Females and Two Groups of Males in Taiwan***

Gender differences in work life have been discussed in research on social stratification and job mobility. In addition to gender, regarding career mobility in Taiwan, people who take CMS at different times in their careers need to be specified, because the findings in this research indicate that the patterns and paces of career mobility are much different between these two groups of people. Taiwanese men who start their careers before engaging in CMS have relative disadvantages in terms of social background and educational achievement. They leave school early, and most start their careers as farmers and blue-collar workers. By contrast, almost all men who postpone their enrollment in CMS have an undergraduate or graduate degree. The institutional setting of CMS in Taiwan constructs two groups of males with distinct educational levels, consequently leading to different processes of career development. Thus, the career mobility of females as well as that of these two groups of males provides three types of variations in the career development process.

Findings in this research reveal that during the long period of a lifetime, an individual's career development parallels the process of life courses, and both are interacting with the changing structure of opportunities and societal development. Therefore, the time dependence of career mobility is deeply embedded in the context of life course in society. For Taiwanese men, the timing of taking CMS (i.e., before or during their careers), is crucial to the pace and type of career development. For Taiwanese women, in spite of their unstable employment throughout careers relative to men's, the more likely they have initial attainment in the public sector based on their

educational achievement and social background, the more they benefit via low transition rates of job mobility in their work lives if they really start their careers in the public sector.

Gender differences in transition rates of job mobility mainly take place in early careers. Among others, Taiwanese women have a typical transition of career development hypothesized in this research. Their careers in early stages are very unstable; they not only change jobs often, but also work "on and off" frequently. While close to three tenths of women's jobs initially undertaken in early careers are ended with leaving the labor force for more than one year, temporary withdrawal from the labor market makes no difference on exit rates of jobs in the early stage of careers. But for the jobs initially held in mid-late careers, discontinuous jobs have transition rates almost triple those of normal jobs. Given females' average 5.62 years of work before marriage, their withdrawal in later careers may be correlated with episodes in the family cycle, such as maternity leave. For males, throughout their careers they pay a higher price for career discontinuity if they do leave, in spite of a much lower proportion of discontinuity they have, compared to women.

Taiwanese women hold a job shorter, but stay in a class longer than the average of the population. Most start their careers in low-level classes (white-collar workers, blue-collar workers, and farmers) and move to employers/self-employed, associate professional, and managerial classes later in their careers. Except for entry into the while-collar class, women move to all social classes less frequently than do men, after controlling for the full set of relevant characteristics. Note that there is also an increase in the proportion of entry into the blue-collar class in later careers, which implies a tendency of polarization for females' social mobility with time spent in careers. Moreover, women are more likely to be constrained within the private sector, and they have more unstable

careers even when they are in the public sector relative to men. Besides, effects of two life events investigated in this research are found to be gender-specific. First birth has strong and negative impacts on females' careers including job change and class mobility, but it does not affect males' at all. Conversely, getting married shows strong influences on males' employment, but does not affect females' throughout careers.

Among other people, males who start their careers after discharging from CMS have the highest proportion of initially attaining professional classes and also enjoy the highest level of prestige status, on average, throughout their careers. Taking advantage of being both male and highly educated, time-dependence of career development is not salient for them, because they move upward from the very beginning of their careers. For this group of people, transition rates of job mobility among career stages are approximately equal, and labor force experience and further education exert effects early on job mobility. By contrast, people with careers interrupted by CMS have the lowest level of occupational prestige in the population, on average. They experience a rush period with extremely high rates of job exits before CMS and directly enter into stable employment characterized by very low transition rates after discharging from CMS. During the period before taking CMS, both upward mobility in occupational prestige and transition across social classes are relatively easily and frequently compared to those in careers after CMS. Most of them start their careers in blue-collar positions, but a very high proportion (close to three tenths) become self-employed or employers right after re-entering the labor force from the military, and the proportion increases even in their current classes.

With respect to the general impression in Taiwan that work before CMS is a stopgap and that a male's career formally starts after being discharged from CMS, results in this research yield no simple answer. On the one hand, job mobility after CMS is well

explained using only information after CMS, and it is first class position after re-entering into the labor force from the military, not the initial class, having constraint effects on job mobility in this period. On the other hand, through investigating differences in levels of transition rates among these career periods, the particularly stable employment in careers after CMS implies that either work experience before CMS or experience in the military helps people avoid prolonged job searches and allows them to easily be matched to jobs after re-entering the labor market from the military. In addition, given a low correlation of prestige between first and current jobs for this group of people ($\gamma = 0.4184$), analyzing only the relation between first and current statuses and not considering the process of status attainment in between would lead to biased results, at least for this group of people. Moreover, it should be noted that individuals who are prone to leave school early are more prone to start their careers before engaging CMS due to the institutional setting of CMS just mentioned. Thus, the divergent trajectories of career mobility derived by different timing of taking CMS found in this research may partly be caused by selectivity on observed and unobserved variables that concurrently affect educational achievement and career development. Further analyses are needed to verify the relationship between education achievements, timing of taking CMS and career mobility for these two groups of males.

***Career Mobility in Taiwan***

According to findings in this research, career mobility in Taiwan is characterized by three phenomena. First of all, there is strong segmentation between public and private sectors in Taiwan and that people seldom change sectors in the labor market throughout their work lives. The salient disproportion of inter-sector transition toward the public and private sectors indicates that the threshold of entering the public sector is higher than that of the private sector, and most job changes take place within the private sector. With

respect to patterns of job change among sectors, promotion experience in public-sector positions encourages people to stay in their jobs and wait for internal advancement, but, in contrast, people who expect to have promotion opportunities in private corporations tend to quit for other jobs in the private sector. These findings indicate the basic differences in patterns of employment toward internal promotion or external shifts as upward mobility in public and private sectors, respectively. In brief, initial attainment in specific segments in Taiwan is important because it affects the pace, patterns, and trajectories of subsequent job mobility throughout careers. Second, Taiwanese people pursue stable employment. Job security has been Taiwanese people's most important consideration when choosing a job, and they tend to stay in positions once they feel a high degree of long-term employment regardless of the segment in which they work. Finally, earning on one's own is "the Taiwanese dream." Moving into ownership (including employers and self-employed) in later careers is a main stream for all Taiwanese people even though women have much lower transition rates than do men. While it may partly result from the sociocultural background in Taiwan, the structural factors such as flexible arrangement of production also provide a low-skill threshold for entry into self-employment or small employers (Shieh 1992b, 1993). In addition, recent research ascribes this phenomenon to weak state regulations in Taiwan which fail to protect disadvantaged workers in the private sector (Yu and Sue 2004). The interplay between this phenomenon and the extremely high proportion of small and medium enterprises in the private sector delineates basic contours of Taiwanese economy.

# Appendix

Table A1 Effects of Initial Attainment in the Public Sector among Propensity Strata, Males (Exponential Transition Rate Models)

| Propensity Strata | Stratum I | Stratum II | Stratum III | Stratum IV | Stratum V |
|---|---|---|---|---|---|
| Constant | -3.41(0.84)*** | -2.31(0.97)* | -1.70(0.89) † | 0.38(1.24) | -1.45(2.25) |
| Discontinuous jobs | 0.87(0.15)*** | 1.08(0.19)*** | 0.89(0.17)*** | 0.76(0.21)*** | 1.03(0.31)*** |
| Propensity score | 2.73(2.93) | 0.18(2.88) | 0.46(1.58) | -0.05(1.18) | -0.84(1.05) |
| Starting career without fulfilling CMS | 1.56(0.11)*** | 1.39(0.12)*** | 1.27(0.13)*** | 1.01(0.22)*** | 0.32(0.52) |
| Further education | 0.41(0.09)*** | 0.14(0.11) | 0.13(0.12) | -0.06(0.16) | 0.29(0.25) |
| General labor force experience | -0.04(0.01)*** | -0.04(0.01)*** | -0.05(0.02)*** | -0.04(0.02)* | -0.02(0.03) |
| Firm-specific labor force experience | -0.04(0.01)*** | -0.10(0.01)*** | -0.13(0.01)*** | -0.14(0.02)*** | -0.11(0.03)*** |
| Number of previous jobs | 0.19(0.04)*** | 0.08(0.05) † | 0.04(0.05) | 0.02(0.07) | 0.05(0.13) |
| First class (Prestige) | 0.01(0.01) | 0.01(0.01) | 0.00(0.01) | -0.02(0.02) | -0.00(0.03) |
| **Initial attainment in the public sector** | **-0.14(0.23)** | **-0.60(0.22)**** | **-0.46(0.15)**** | **-0.57(0.17)**** | **0.01(0.26)** |
| Married | -0.32(0.09)*** | -0.30(0.11)** | -0.61(0.12)*** | -0.31(0.16) † | -0.55(0.31) † |
| Parenthood | -0.10(0.22) | -0.30(0.15) † | -0.02(0.15) | -0.17(0.18) | 0.17(0.34) |
| PE1:Industrialization | 0.39(0.05)*** | 0.43(0.06)*** | 0.44(0.08)*** | 0.26(0.10)* | -0.07(0.19) |
| PE2: Economic cycle | -0.04(0.03) | -0.02(0.04) | -0.01(0.04) | -0.11(0.06) † | 0.09(0.10) |
| Number | 1119 | 665 | 532 | 275 | 91 |
| Log likelihood (final estimates) | -3230.2114 | -1746.2736 | -1438.9486 | -809.9532 | -294.9695 |
| Likelihood-ratio statistics (Model $\chi^2$) | 839.7364*** | 628.246*** | 443.4224*** | 247.4796*** | 66.1206*** |
| Degrees of freedom | 13 | 13 | 13 | 13 | 13 |

Note: † statistically significant at the 0.1 level, * at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The standard deviation is in parentheses.

Table A2 Effects of Initial Attainment in the Public Sector among Propensity Strata, Females (Exponential Transition Rate Models)

| Propensity Strata | Stratum I | Stratum II | Stratum III | Stratum IV | Stratum V |
|---|---|---|---|---|---|
| Constant | -0.57(0.89) | 0.18(0.86) | -0.82(1.18) | -1.40(1.54) | -1.55(2.26) |
| Discontinuous jobs | 0.29(0.07)*** | 0.38(0.09)*** | 0.19(0.13) | 0.77(0.17)*** | 0.95(0.23)*** |
| Propensity score | 3.67(2.85) | 1.15(2.84) | -1.08(1.93) | 0.55(1.39) | -2.41(1.07)* |
| Further education | -0.13(0.12) | 0.09(0.11) | 0.06(0.14) | 0.01(0.18) | -0.82(0.34)* |
| General labor force experience | -0.05(0.01)*** | -0.03(0.01)** | -0.03(0.01)* | -0.08(0.03)** | -0.06(0.03)* |
| Firm-specific labor force experience | -0.07(0.01)*** | -0.09(0.01)*** | -0.08(0.02)*** | -0.11(0.02)*** | -0.09(0.03)*** |
| Number of previous jobs | 0.14(0.04)*** | -0.01(0.04) | 0.06(0.06) | 0.03(0.11) | 0.10(0.11) |
| First class (Prestige) | -0.01(0.01) | -0.02(0.01)+ | -0.00(0.02) | -0.00(0.02) | 0.02(0.03) |
| **Initial attainment in the public sector** | **-0.33(0.25)** | **0.08(0.16)** | **-0.51(0.18)**** | **-0.65(0.19)***** | **-0.45(0.23)**†** |
| Married | -0.68(0.10)*** | -0.59(0.11)*** | -0.46(0.15)** | -0.38(0.19)† | 0.01(0.25) |
| Parenthood | -0.26(0.16) | -0.25(0.14)† | -0.28(0.15)† | 0.22(0.22) | -0.47(0.27)† |
| PE1:Industrialization | 0.37(0.06)*** | 0.36(0.06)*** | 0.25(0.09)** | 0.25(0.12)* | 0.17(0.16) |
| PE2: Economic cycle | 0.00(0.03) | -0.04(0.04) | 0.00(0.05) | -0.06(0.07) | 0.08(0.09) |
| Number | 947 | 738 | 374 | 207 | 122 |
| Log likelihood (final estimates) | -2725.3085 | -1964.5966 | -997.3908 | -588.0325 | -352.9719 |
| Likelihood-ratio statistics (Model $\chi^2$) | 405.8102*** | 273.4558*** | 108.9594*** | 132.4228*** | 97.8788*** |
| Degrees of freedom | 12 | 12 | 12 | 12 | 12 |

Note: † statistically significant at the 0.1 level, * at the 0.05 level, ** at the 0.01 level, and *** at the 0.001 level. The standard deviation is in parentheses.

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# Vita

Yi-Wen Lin was born in Keelung city, Taiwan on February 3, 1973. Her mother, Mei-Li Tsai, raised her and other three daughters independently. She received both her bachelors' and master's degrees of Sociology in the National Taiwan University, Taipei, Taiwan. She transferred her major from Forestry to Sociology in the early years of college, and joined many research projects sponsored by Archival Committee of Taiwan Province concerning the difficult life situations and discrimination indigenous people suffered in cities. In the summer of 1995, she earned a research grant sponsored by the National Science Council. The main purpose of this grant is to encourage college students to do independent research. Her project examined the changes in the social network among indigenous people after they immigrated to cities and its functions which supported them to adjust urban life. By a network analysis using a dataset of 700 links and in-depth interviews with 121 indigenous people, she revealed social meanings and their social context in which these people are confronted with structure constraints, cooped with them and even to make good use of them.

After leaving college, she worked as a full-time research assistant and interviewer trainer in "Social Change Survey" in the Institute of Sociology, Academia Sinica, taking charge of the process of survey and receiving complete and well-designed training in quantitative research at the same time, such as sampling, questionnaire design, and the techniques of categorical data analyses and structural equation modeling. In the summer of 1998, she were granted an opportunity to present a research paper titled as " Four Response Effects of Social Desirability" (co-author with Dr. Wu, Chyi-In) in the

Conference of Survey Method and Application held in Academia Sinica. This paper found that four types of effects: independent, spurious, moderator and main effects, derived from social desirability may cause response bias against the validity of survey.

Her interest areas turned to economic sociology, social stratification and national development during her graduate school. Her master's thesis tried to explore: how Taiwan, a late- comer in the semiconductor industry, could develop advanced skills on its own and avoid the situation of underdevelopment in the world system of capitalism, presumed by dependency theories. Data came from 2500 news as well as in-depth interviews with 13 IC manufacturers in Hsinchu Science-Based Industrial Park. The main findings were that as original equipment manufacturers (OEMs), Taiwan's corporations were capable of independently developing new technology through the long-term accumulation of the tacit knowledge, rather than mere duplication of explicit knowledge via commercial or technological alliances. The Taiwan's case delineated a complicated and detoured learning path applied by developing countries. After receiving her master's degree of sociology, she worked for her advisor, Dr. Chen, Dung-Sheng, in a research project concerning the dynamics of the organizational network among groups of large corporations when they marched into the new market of the telecommunications industry in Taiwan. This project investigated the process of liberalization in which high cohesion within affiliations of large corporations reversely contributed to the distrust in Taiwan's society.

In August 2001, she received a teaching assistantship and entered the graduate program of Sociology in the University of Texas at Austin. She presented the paper, (co-author with Dr. Powers, Daniel) "Occupational Mobility Within and Between Segmented Labor Markets", in the regular session of labor markets in the annual meeting of American Sociology Association in 2004, and entered her candidacy in the fall of 2005.

After then, she earned the fellowship of visiting fellow program in the Institution of Sociology, Academia Sinica in 2006 and moved back to Taiwan. This project provided infrastructure support and fellow advices for doctoral candidates to conduct their dissertation research. She got married in the summer of 2006, entered into motherhood after two years, and received her Ph.D. degree of sociology in the spring of 2010.

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This dissertation was typed by the author.